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IDENTIFIERS *Human Ecology

ABSTRACT

The program's goal is to provide high school students an opportunity to become an active force in the advancement of the human condition and to develop positive attitudes to improve their effectiveness in dealing with their environment. The student handbook consists of eight chapters, including an introduction to the program in chapter I. Chapter II, "Self-Inventory," helps students decide who they are and what they want to be. Students discuss human relations in the school. In chapters III and IV students study the physical and psychological development of humans. Chapters V and VI focus on social institutions and the physical environment and their effects on people. Chapter VII, dealing with community service, helps students understand their responsibility to contribute their time and talents to helping others. Students volunteer 25 hours of their time to work in hospitals, nursing homes, and senior citizen centers. Other learning activities include reading and discussing chapters from textbooks and short selections included in the handbook, viewing films and filmstrips, and listening to outside speakers. A student workbook containing written exercises is also provided. (RM)

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BRANDYWINE SCHOOL DISTRICT

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A HIGH SCHOOL PROGRAM IN ...

SO 015 513

A HIGH SCHOOL PROGRAM IN HUMAN ECOLOGY:

Helping Everyone Live Productively

Student Handbook

September, 1981

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INTRODUCTION

BRANDYWINE SCHOOL DISTRICT

HUMAN ECOLOGY

STUDENT HANDBOOK

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BRANDYWINE SCHOOL DISTRICT

PENNSYLVANIA AVENUE
CLAYMONT, DELAWARE 19703
(302) 792-3800

Curriculum development is an on-going process. New knowledge about the learner and the learning process, changes in society and the changing needs of students demand that schools and teachers constantly re-evaluate and modify curriculum to best serve their student population.

This modified version of the Guide is presented to teachers, parents and students for implementation and review.

The basis for instructional decisions is the Policy for Curriculum and Instruction approved by the Board of Education in May, 1981. Curricular and instructional practices should be consistent with this Policy.

Instructional personnel are expected to plan curriculum and conduct instruction in ways that are consistent with the Policy for Curriculum and Instruction. The Board of Education solicits comments on this document. After implementation in the classrooms, all personnel who wish to make suggestions and constructive recommendations should submit these to their immediate supervisor to be forwarded to the Assistant Superintendent for Curriculum and Instructional Services.

Frank J. Furgele
Superintendent

STUDENT HANDBOOK

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BRANDYWINE SCHOOL DISTRICT

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INTRODUCTION

Brandywine School District is proud to have the first school program in Human Ecology in the state of Delaware. The need to preserve and conserve our national resources, in terms of land, water and air, is being addressed by our society. However, our most important resource, the human resource, is not given equal consideration.

Human Ecology is caring for ourselves and others in a productive way. The Human Ecology program includes the study of the physical and psychological development of humans, the physical environment and its effect on people, as well as our social institutions. There is a strong emphasis on effective parenting.

Another section of the program, the community service component, assists our students to understand their responsibility to contribute their time and talents in helping others. Students volunteer twenty-five hours of their time to work in hospitals, nursing homes and senior citizen centers. This program provides students an opportunity to become an active force in the advancement of the human condition and to develop positive attitudes to improve their effectiveness in dealing with their environment.

Frank J. Furgele
Superintendent

A HIGH SCHOOL PROGRAM IN HUMAN ECOLOGY:
HELPING EVERYONE LIVE PRODUCTIVELY

RATIONALE:

The motivation for the conception and design of a high school program in Human Ecology emanates from my firm conviction, after 25 years of delivering pupil services in the schools, both as a practitioner and as an administrator, that an urgent need exists today to develop more programs which address the prevention of human problems. We all know in recent times, a major emphasis has been placed on the conservation, preservation, and development of our natural resources, the land we tred, the water we drink, the air we breathe, as well as plant and animal life. This process is called ecology. It is being done for good reason because our natural resources are being adversely affected in terms of not only their quality but also a gross depletion in their number. Man himself, as well as the products of his labor, are culprits of this massive environmental holocaust. Man's recognition of this natural condition has prodded consciences to initiate programs and practices and indeed laws, in the public and private sector, in an effort to restore a positive balance in the natural environment.

Does a similar need exist to conserve, preserve, and develop, to its fullest potential, the most important resources on the face of the earth, out human resources?

Another way to phrase the question is, what is the state of the human condition in this, the twentieth century? A century only three quarters complete has seen more scientific and technological achievements than the previous nineteen centuries put together. Cures for

disease, smallpox and polio, an increase in man's life expectancy, and deliverance of a man on the moon, are just a few of these achievements. Within this decade the prosperity of the national economy, in general, has been the best in our history.

Has the state of the human condition kept abreast of the scientific and technological advances? The evidence does not support an affirmative answer when, in the land of plenty and opportunity, the human condition presently exists where:

- -Teen-age illegitimacy, crime and suicide are increasing at alarming rates, suicide is the second leading killer of teen-agers;
- -Mental and emotional handicaps are prevalent but can be prevented; in 1961, the president's panel on mental retardation stated that "Mental retardation could be reduced by 50% by the year 2000 if we applied our present knowledge and technology in the prevention of retardation."
- -Birth defects are the second greatest destroyer of life in the U.S. Preventive information, particularly in the area of substance abuse, to "potential parents to be" can insure that infants are born physically a mentally perfect as present knowledge permits;
- -Separation and divorce statistice indicate one out of every two marriages are not successful;
- -Millions of our senior citizens are not properly cared for, at a time, when the average life span is seventy-two years of age.

The list could go on and on. If, as some assert, our society, is as strong as its weakest links, then the human condition needs a great deal of improvement. Human Ecology must become an urgent priority in the United States and Delaware equal to the ecology of nature. Can man's conscience be prodded to initiate programs and practices in the public and private sector, as well as in each individual to actualize the mission of Human Ecology - to conserve, preserve, and develop

the most important resources on earth, our human resources. An all-out effort in Human Ecology is needed in this young but very advanced nation.

What better way to implement the process of Human Ecology than to teach it in the schools. In September, 1980, Brandywine High School in the New Castle County School District introduced an innovative program in Human Ecology. The course was announced as an elective course open for selection by all tenth, eleventh, and twelfth grade students. The course elements include unit tests, academic grades, and one-half credit.

DEFINITION:

The program uses as a model, Cornell University's definition of Human Ecology which is, "a study which related to the development of individuals and the well being of both individuals and families in their immediate social and physical environments. The study seeks, through research, education, and the application of knowledge in the humanities and the physical, bioligical, and social sciences possible solutions to problems of human welfare and family well being which are of compelling significance in contemporary society".

NEEDS ASSESSMENT:

1. Students need to know, understand, and appreciate the elements necessary for the physical and emotional health of humans. Information to support this need are included.

2. Students need to know and appreciate the physical factors in the natural environment (pollution) which interfere with the optimal growth and development of humans.

3. Students need to know and appreciate the patterns of reproductive and child-rearing practices that reduce the probability of future physical, mental, and emotional handicaps.

4. Students need to know those factors responsible for the development of healthy families.

HELPING EVERYONE LIVE PRODUCTIVELY
NEEDS ASSESSMENT
continued

5. Students need to demonstrate their individual concern for the improvement of the quality of living, by actively participating in mini-human service programs with community agencies.

6. Students interested in a career in the field of human services need to refine their career choices by having direct contact with professionals in the field.

7. A need exists to extend the Human Ecology Program to additional participants from schools and communities in New Castle County and surrounding areas.

GOALS:

The overall goal of the Human Ecology program is to provide an opportunity for students to become an active force in the advancement of the human condition through the acquisition of knowledge, skills, and attitudes which will improve their effectiveness in dealing with their environments.

The course content material deals with the accomplishment of the following specific objectives which vitally affect, positively or negitively, the development of humans;

a) Students will be able to recognize and discuss critically patterns of reproductive and child-rearing practices that reduec the probability of future physical and mental handicaps, e.g. influence of substance abuse, infection and nutrition on the growth of the fetus;

b) Students will be able to identify and analyze those factors responsible for the development of healthy families according to recognized authorities, e.g., stages of child development and effective parenting techniques;

c) That students will be able to identify those elements necessary for and detrimental to the psychological health of human beings. Causes and prevention of suicide are included in this area of study.

d) Students will be able to identify and discuss critically the physical factors in the natural environment (pollution) which interfere with the optimal growth and development of human beings. Nationally validated curriculum materials from the Union Township School District, Union, NJ, treat the broad areas of air, water, and land usage.

HELPING EVERYONE LIVE PRODUCTIVELY
GOALS
continued

e) Students will demonstrate their individual concern for the improvement of the quality of living by actively participating in mini-human service programs with community agencies.

f) Students and staff involved in the Human Ecology course will plan, develop, and implement appropriate Human Ecology programs involving the schools and community agencies of New Castle County and surrounding areas.

Jack Carney
District Coordinator

SELF INVENTORY

HUMAN ECOLOGY

"WHO AM I?"

Instructional Objectives:

The student will complete:

1. A Human Ecology Survey
2. A Religious Survey
3. A Family Survey

The student will write a 100 word essay entitled "Who Am I?" and hand this in as a homework assignment.

Materials:

1. Human Ecology Survey
2. Religion Survey
3. Family Survey

Activities:

Your teacher will administer the 3 surveys on the first day and assist you in interpreting the results for use in their self-analysis.

HUMAN ECOLOGY

"WHAT DO I WANT TO BE?"

2 Days

Instructional Objectives:

The student will:

1. inventory their own interests
2. inventory their vocational preferences
3. understand how this inventory is interpreted

Materials:

Vocational Preference Inventory

HUMAN ECOLOGY

MOTIVATION

"WHAT YOU MAY WANT TO BE"

4 Days

Instructional Objectives:

The student will:

1. employ values-clarification techniques as a means of helping students evaluate preferences and priorities in terms of social and vocational options.
2. develop an awareness of how social roles and behavior patterns are formed.
3. provide information about legislation and executive orders which have increased social and career opportunities for all.

Materials:

1. "What's in a Name" cards
2. Film - "Anything You Want to Be"
3. worksheets to correspond to film

HUMAN ECOLOGY

HUMAN RELATIONS IN THE SCHOOL: WHAT, WHY, HOW

3 Days

Instructional Objectives:

The student will be able to:

1. define human relations
2. describe the benefits from practicing effective human relations skills
3. describe specific ways of improving one's relationships with others

HUMAN RELATIONS: WHAT, WHY, HOW?

WHAT?

To study human relations is to examine the ways that people form and conduct relationships with one another. Why is it that sometimes people get along with each other and sometimes they don't? Clearly, that is a most difficult question to answer.

Relationships between people are often very complex and can be either effective or ineffective. When people get along well together, they are practicing effective human relations and their relationship is pleasant and mutually rewarding. Effective human relations involves understanding other people and skillfully relating to them. It means appreciating other people and treating them with courtesy, tact, respect, and consideration. Since every person is unique, it is not always easy to understand and relate to the many different people you come in contact with. On occasion, it can even be quite difficult. When people don't get along well, it is generally because ineffective human relations skills are being practiced.

To appreciate the significance of human relations, you only need to consider the number of people that you have or will come in contact with during your life. If you count all of your family, friends, acquaintances, co-workers, supervisors, customers, teachers, etc., you will probably be astounded by the sheer number of people who touch your life in some way. A major part of your life is made up of other people. Some of these relationships are rather structured, such as those which develop at work. In these relationships, there are rules to go by, well-defined positions, and clear lines of authority.

Other relationships are much more casual, such as those with friends. To be effective, you must be able to adapt your human relations skills to the different situations in which you find yourself.

WHY?

Effective human relations skills are especially important in business. At work you are required to interact frequently with supervisors, co-workers, and customers. You must be able to get along and deal effectively with all of these people if you are to perform your job well. Have you ever wondered about the number one reason for people losing their jobs? Lack of technical knowledge? Inability to carry out the job tasks? No! Of all people who lose their jobs, approximately 85% do so because they are simply not able to get along well with others! That is certainly a starting figure.

On the positive side, there are tremendous benefits to be reaped from practicing effective human relations at your place of employment. The list below cites some of the many advantages of getting along with others at work.

1. Increased cooperation from others.
2. Feelings of friendship and goodwill.
3. Pleasant working environment.
4. Increased productivity.
5. Increased employee morale.
6. Improved customer impressions of the business.
7. Increased customer loyalty and patronage.
8. Increased employee loyalty.
9. Reduced employee absenteeism.
10. Increased job security.

HOW?

At this point, we have discussed the meaning of human relations and the many benefits to be derived from practicing effective human relations skills - particularly at work. It is now time to focus on how to go about developing effective relationships with others.

What skills do you need? Which ones do you already possess? Which ones do you need to work on? Study the following list of things that you can do to improve your ability to get along well with others.

TO IMPROVE YOUR RELATIONSHIPS:

1. Get to know and understand yourself.
2. Get to know and understand others.
3. Be sensitive to the needs and feelings of others.
4. Show a sincere interest in others.
5. Accept and respect others for what they are.
6. Help others and be willing to share.
7. Set high personal standards for honesty and fairness.
8. Accept responsibility for your own actions.
9. Maintain an objective point of view.
10. Be dependable.
11. Be cheerful and demonstrate a positive attitude.
12. Avoid arguments.
13. Admit your own errors.
14. Smile.

Well, how do you think you stack up? It is important to realize that none of us possess "perfect" human relations skills. Do not become discouraged though. While we cannot achieve perfection, we can improve our ability to get along with others. You see, human relations skills can be learned and refined. This requires, however, that you practice your skills every day. The most important ingredients for your successful improvement will be a sincere, positive attitude and personal determination!

PHYSICAL DEVELOPMENT

HUMAN ECOLOGY

"PASSAGES"
A DEVELOPMENTAL JOURNEY THROUGH LIFE

2 Days

Instructional Objectives:

The student should be able to:

1. identify the major stages of development in terms of when they occur.
2. identify factors that determine ones developmental passage through a stage of life (heredity vs. environment).
3. describe the three major goals in the adolescent period.

Materials:

1. discussion notes
2. filmstrip - "Adolescence: Changing Years", Human Relations Media
3. objectives and test questions

HUMAN ECOLOGY

"PASSAGES"
NOTES OUTLINE

Passing through life up to this point...How you have arrived at being what you are from a psychological and a physicological perspective...

Looking at life as a continuous thread is ok, but it is easier to cut it up into smaller pieces...to identify stages of development that you pass through...

In psychology and biology this is done to organize the study of time...(lead question)...When can I expect to be able to do this?

Time is cut up into stages:

PreNatal;	conception/2 weeks	Germinal
	2 weeks/6 weeks	Embryonic
	6 weeks/term	Fetus
	Birth/2 weeks	Neonate
	2 weeks/2 years	Infant
	2 years/6 years	Pre
	6-9	Primary
	9-12	Middle
Adolescence:	12-13	Junior/teenager
	17-22	Young man/woman
	22-40	Young adult
	40-60	Middle age
	60-?	Old age, senility, death

What determines your passage through any stage...The answer centers around nature vs. nurture (H vs. E) Heredity is Genetics! (Environment...Uteral - Home - School

Each stage has certain tasks to be accomplished; if they're not, one goes crippled into the next stage.

Physiological - Pre Natal Care
Psychological - Oral Sadistic (Freud)
Educationally - Reading/Math; Sensory/Concrete Formal

*Adolescence - How did you get in/ Puberty
How do you get out/ Economics/Social/Biologically

HUMAN ECOLOGY

"PASSAGES"
Continued

-Gain Freedom

-Gain Privileges of Adult

-Do As You Please

-Decide Upon a Career [fantasy/interest/reality]

HUMAN ECOLOGY

DEVELOPMENTAL FACTORS

Lesson 4 - Embryonic Development

Instructional Objectives:

The student will:

1. gain information about pregnancy and normal fetal development.
2. understand the factors that can influence a baby's health from the moment of conception on.
3. understand that the first three months of pregnancy when all the baby's structures are being formed is the time when the fetus is most vulnerable to damage from its environment.

Materials:

1. One Doctor's Notes on Pregnancy
2. Nine Months to Grow In
3. From Your Past to Your Future

Activities:

1. One Doctor's Notes on Pregnancy:

2. What happens to the parents and to the developing fetus during the nine months of pregnancy? This section describes the major events of fetal development. It focuses particularly on the first three months, when the fetus is especially vulnerable to birth defects and accidents. Comments by parents describe their awareness of what is happening, as well as their thoughts and feelings about these events.

   Point out that different kinds of information are presented.

   * The drawing - A scale rendition shows the approximate size of the fetus during the time period described on that page.
   * The heading - This indicates the time period, and is followed by a descriptive quote from a woman at this stage of pregnancy.
   * The characteristics of the pregnancy - The physical changes experienced by the mother, and the way she might be feeling physically and emotionally, are described.

HUMAN ECOLOGY

DEVELOPMENTAL FACTORS
continued

* Information about the fetus:- How it is changing size, which physical features and bodily functions are developing, and what activities are occurring within the uterus are described.

"ONE DOCTOR'S NOTES ON PREGNANCY"

As we have seen, there are many different conditions under which a baby can be said to begin his or her role in a family. Sometimes the family plans far in advance; sometimes a particular time just "feels right" for having the baby. Often the baby comes along without advance consideration, and the family adjusts to this as it happens.

One thing is common with all babies, however. All babies begin their physical development with the same event, the joining of a woman's egg and a man's sperm. This is called fertilization or impregnation. It is from this physical joining of the man's sperm and the woman's egg that all babies begin to develop. At this point, the woman is pregnant, and the fertilized egg develops inside her.

The following questions and answers about pregnancy were developed by an obstetrician-gynecologist (a doctor who specializes in the health of women).

HOW DOES A WOMAN KNOW SHE'S PREGNANT?

Some women have no signs of pregnancy for several weeks. The first significant sign of possible pregnancy is when an expected menstrual period does not occur. The longer the period is delayed, the more likely that this woman is pregnant. A lot of women have an idea they may be pregnant because their breasts may become unusually tender or sore at the time of the missed period. But this is not a certain sign, because some women have very sensitive breasts just before each menstrual period. Enlargement of the breasts, however, is a likelier indication of pregnancy. Other signs are that the woman may feel nauseated (although many do not), and/or may suddenly feel tired and need more sleep.

HOW DOES A WOMAN FIND OUT IF SHE IS PREGNANT?

Two weeks after a woman has not had her period at the expected time (six weeks after her last period), she can have a quick, simple, and inexpensive test to find out if she is pregnant. The pregnancy test requires a urine sample, to which chemicals are added. This sample can be checked in a matter of minutes in the doctor's office or in a medical lab, and the result will be reported to the woman: "positive if she is pregnant, "negative" if she is not.

WHERE CAN A WOMAN GO TO GET A PREGNANCY TEST?

A pregnancy test is quite simple, and can be done in a variety of places:

* A woman can go to her family doctor, and ask him or her to perform the test or recommend someone who can.
* She can go directly to an obstetrician/gynecologist. These doctors

"ONE DOCTOR'S NOTES ON PREGNANCY"
continued

can be located through friends, through her family doctor, through any hospital or clinic, or by looking through the phone book.

* A woman can go directly to the out-patient clinic of a nearby hospital or clinic, and have the test done there.

* A woman can go look up the number for her local or state public health department, or her local or state chapter of the American Medical Association. They will help by identifying a nearby doctor, hospital, or clinic. Many hospitals and clinics have designed procedures that are quick and that insure confidentiality for the woman receiving the test.

"NINE MONTHS TO GROW IN"

THE FIRST WEEK OF LIFE:

Mother

Neither parent can be sure that fertilization has occurred during these first seven days. There is no way that either the father or the mother can be aware of what is happening.

Conception occurs when one sperm of the many millions ejaculated by the male penetrates the egg of the female. The genetic blueprint that will guide the development of this fertilized egg into a baby is already set. The fertilized egg is invisible to the naked eye.

During the first seven days (third week after last menstrual period) the fertilized egg divides and redivides, and becomes a ball of cells, moving down the fallopian tube toward the uterus or womb. Different cells are beginning to behave in different ways, depending on what organs they are forming.

Embryo

The genetic makeup of the infant is set. (sex, coloring, body shape, etc.)

Cells that will become different organs (eyes, heart, lungs, etc.) already behave differently.

Almost half of all fertilized eggs never make it beyond this stage.

FOURTH WEEK OF LIFE:

Mother

A late menstrual period does not always mean pregnancy. Some women may experience slight bleeding during their regularly scheduled menstrual period, but do not have a "real" period. They could be pregnant without the usual clues.

Implantation occurs when a fertilized egg attaches itself to the lining of the womb, where it receives nourishment from blood cells.

Embryo

The fertilized egg grows very rapidly doubling its size every 24 hours. But it is still barely visible to the naked eye.

The cells continue to develop specialized shapes and functions.

The fertilized egg is now called an embryo. It is about 1/12 inch long.

The backbone, nervous system, spinal cord, and eyes begin to form. The heart begins to beat.

"NINE MONTHS TO GROW IN"
continued

SIXTH WEEK OF LIFE:

Mother

The mother doesn't look pregnant at all. She may not know for sure unless she has been tested. She may tell the father about the possible pregnancy, or she may wait for the test results.

Her menstrual period is now two weeks overdue. This may be the first time, or it may have happened before when she wasn't pregnant. Irregular menstrual periods without pregnancy are common for adolescent girls, and sometimes for older women.

This is the earliest time when a pregnancy can be diagnosed by a laboratory test; the mother's urine now contains a hormone put out by the placenta - the material connecting the embryo to the wall of the womb. When a sample of her urine is mixed with a chemical, the presence of this hormone will show up if she is pregnant. The test takes only a few minutes. It is very accurate.

There are other clues that she may be pregnant. She may feel nauseous when she wakes up in the morning, and she may vomit. Her breasts may be growing large, and she may need to urinate more often. She may feel tired and wish to nap in the afternoon. It's time for her to see a doctor to make sure.

Embryo

The embryo is now about ¼ inch long, the size of a pencil eraser. The embryo has grown tremendously since conception. It is now 10,000 times bigger than it was at first.

The embryo is now made up of three layers of cells, each different from the others. If the embryo continues to grow, the outer layer becomes skin, hair, nervous system. The middle layer forms muscles, bones, blood vessels, kidneys, and sex glands. The inner tract becomes the digestive tract, lungs, and urinary system.

The head is forming. Arms and legs begin to develop.

By the end of six weeks after conception the outer layer has folded over to make a tube; the spinal canal. The brain forms at one end and begins increasing in size. The spinal cord and entire nervous system are forming.

Depressions where eyes and ears will appear are visible.

EIGHTH WEEK:

Mother

The mother has missed her period for the second time. Pregnancy is hard to deny to herself, but nothing shows to others. She may have gained a few pounds.

Ordinary chores may now require more effort; she may need help from the father, family, and friends with her daily routine.

The mother's womb is getting larger to make room for the developing baby, which is now called a fetus. By doing a pelvic exam, a doctor can feel that the womb is now enlarged to twice its normal size.

Embryo

The embryo, growing very fast, is about one inch long and looks human. All the structures that will be present when the baby is born will have been formed, or have bagun to form.

This part of pregnancy, when all these structures are developing, is the time when the embryo is most vulnerable to damage from its environment.

A skeleton begins to form, but it is soft cartilege, not hard bone.

Fingers and toes develop. The embryo kicks now, but too softly for the mother to feel.

The features of the face become clearer, more definitive.

Ears develop on the head. The brain is growing, and by the end of this month, the brain will begin to function and to direct the embryo's first movements.

Fingers separate on the hands. By the end of this month, the embryo can touch its face.

TWELFTH WEEK:

Mother

Sometimes the mother has a feeling that is hard to describe of a delicate, fluttering "something" happening inside her. If she has been pregnant before, she may be able to identify this feeling as the movement of the baby in the uterus. Or she may not recognize what is happening or be able to describe it to anyone else.

Sometimes the mother has heartburn and trouble with her breathing. She may be getting over her nausea if she had experienced any.

Her uterus is the size of an orange.

"NINE MONTHS TO GROW IN"
continued

Embryo

The embryo weighs about one ounce.

Bones harden.

The embryo squints, opens mouth, purses lips.

Arms, legs, hands, feet, fingers and toes are fully formed. Nails appear. Fingers can form fists.

The embryo moves vigorously, and by the end of the month, it can kick, swim, and somersault.

THE FOURTH MONTH:

Mother

By the end of this month, the mother knows that she feels the baby moving.

The mother has gained enough weight, 8 to 10 pounds, to make a difference in the way she looks. Her belly sticks out. Her clothes may be too tight, and she will start to wear maternity clothes. She looks pregnant.

During this month or next, the mother probably will begin to stand and walk diffenently - leaning back a little to balance the way her belly sticks out in front.

Fetus

The fetus is eight to ten inches long, and weighs six ounces.

Eyebrows and eyelashes form.

The fetus may suck its thumb. It kicks vigorously.

THE FIFTH AND SIXTH MONTHS:

Mother

Pregnancy is very evident - to the mother and to anyone else who sees her. She probably has gained about 15 pounds, although there is wide variation.

Her daily activities continue as usual. She goes to work or school, takes care of a house and children, or does all these things.

The uterus continues to stretch. By now, the doctor can feel the top of the uterus above the level of her navel.

"NINE MONTHS TO GROW IN"
continued

The mother is less tired now. Nausea doesn't bother her anymore.

Fetus

The baby can open and close its eyes.

The baby can hear and respond with sharp movement to sudden noises.

The baby sleeps and wakes. When awake, the baby kicks and twists and turns.

The baby is getting hair on its head.

By the end of this period, the baby will weigh about two pounds and be 14 or 15 inches long.

The baby is still not mature enough to survive in the outside world. If born now, his or her chances of living would be very small, but not impossible.

THE FINAL TRIMESTER:

Mother

The mother is big with pregnancy now. She may feel clumsy, and it's hard for her to do many simple things, like tying her own shoes or turning over in bed. She may have some swelling in her face or hands and feet.

Sometimes the mother finds this tremendously changed body difficult to accept as her own. She may feel ugly and unlovable. She can feel better or worse about herself, depending on how the people around her react.

She gets tired now. Some jobs at work or home may be too much for her. She often needs help from the father and others to take over the heavy jobs. If she gets help, she can still work and run a household until she goes into labor.

Fetus

The baby grows rapidly. At seven months the average baby weighs almost four pounds and is over 16 inches long. By the end of the ninth month, the average baby will be about 19 inches long and weigh more than seven pounds.

"NINE MONTHS TO GROW IN"
continued

A baby born in this final three months has a good chance of surviving outside of the womb. The longer the pregnancy lasts and the more it weighs, the better the chances of survival. With proper care even a 3½ pound baby has a very good chance of survival. A 5-pound baby probably will not need to be placed in an incubator.

There is less room for the baby to move around. He or she quiets down, and gets into position for being born. Usually this is with the head downward.

"FROM YOUR PAST TO YOUR FUTURE"

There is no such thing as the perfect time for all people to have a baby. Some people can have a really great time in the middle of hardship, while others can have problems in what looks like a terrific setup. Unfortunately, many people don't choose when to have a baby, and others choose the worst possible time. Some people have babies for the wrong reasons: to make him or her get married; to "help" a relationship that is about to end; to give in to pressure from married friends before their own marriage is ready for children. On the other hand, people can plan. They can decide the best time to have a baby. They can learn what a baby will mean in their lives and how they can handle all the responsibilities that come with a baby, before having the baby instead of afterward.

A wonderful quality people have is the ability to change and adapt, to discover new beginnings from old situation. People can learn from their experiences and the experiences of others. Things sometimes happen in ways people don't expect, or at unplanned times. The very fact we can't predict and chart our own futures is part of the excitement of life.

The time lines you made may be exciting to think about now, but would they still be exciting if you knew that everything on them was going to happen exactly as you hope? On the other hand, if you never planned anything in your life, the chances of getting some things you want would be less. You know you're not very likely to have money for that car you want, or that stereo, or new outfits or big concerts coming up, unless you do something about it in advance, and do something to make it happen. Thinking ahead can bring you closer to your goals, ever if things don't turn out exactly the way you thought they would.

Beginnings are really the last steps people take from their own pasts, the first steps they take into their own futures. Your own beginnings are rooted in the past, and the beginnings of your possible children extend into the future. The thoughts you have now about the future reflect what you know and hope for, and who you are. They are steps toward what you might become. They are your beginnings, and possibly those of your children.

HUMAN ECOLOGY

DEVELOPMENTAL FACTORS
DEVELOPMENTAL HANDICAPS

1 Day

Instructional Objectives:

The student will be able to:

1. identify categories of exceptionalities
2. list factors that place normal development of the infant into a "risk situation"
3. be aware of society's changing view of the treatment and care of handicaps

Materials:

1. handout - "Categories of Exceptionality"
2. handout - "Risk Factors"
3. handout - "Historical Progression of Society's View of the Handicapped"
4. evaluation sheet - 4 questions

Activities:

Read the three reference sheets associated with the above objectives and discuss the nature of handicaps factors which cause them to occur, and the categories to be diagnosed. A Historical View of Society's View of the Handicapped is also emphasized.

Evaluation:

Four question quiz on above objectives

CATEGORIES OF EXCEPTIONALITY

Emotionally Disturbed: Children who exhibit learned behaviors which are consistently maladaptive or inappropriate

Learning Disabled: Children who exhibit a disorder in one or more of the basic pyschological processes involved in understanding or in using spoken or written language

Mentally Retarded: Children who exhibit subaverage general intellectual functioning which originates during the developmental period and which is associated with impaired adaptive behavior.

Visually Handicapped: Children who either have partial sight or who are blind.

Hearing Impaired: Children who are hard or hearing or are deaf.

Speech Disorders: Children whose speech diviates so much from that of others that it calls attention to itself, interferes with communication, and/or causes maladaptive behavior.

Physically Handicapped: Children who are crippled as a result of neurological, orthopedic, or chronic health disorders.

Gifted: Children who exhibit outstanding ability or attainment: often defined by an I.Q. of more than 120 points.

from Garwood, S.G., "Educating Young Handicapped Children". 1979

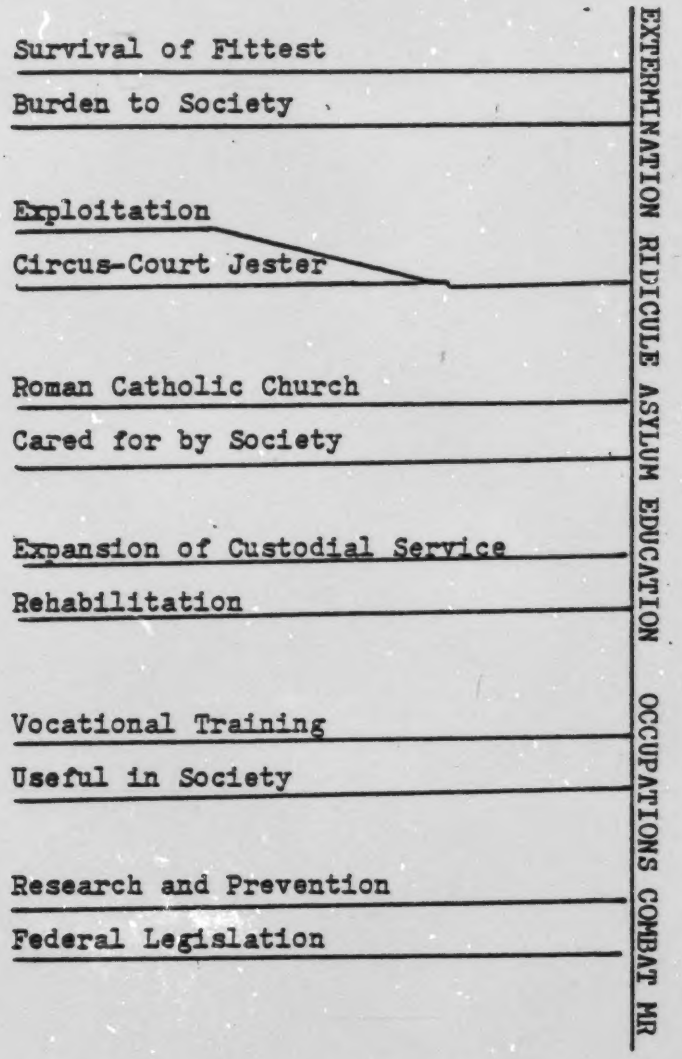
HUMAN ECOLOGY

RISK FACTORS

PREGNANCY	DELIVERY	INFANCY
maternal age (≤ 15 or > 35)	prematurity	accident-injury
poor nutrition	prolonged labor	infection (meningitis)
alcohol, drug usage	C-section	lead poisoning
smoking	trauma-forceps	abuse
radiation exposure	lack of oxygen	deprived environment
previous abortions	apgar < 5 @ 5 min.	failure to gain weight
genetic inheritance		seizures
infection (rubella)		head size
blood incompatibility		

HUMAN ECOLOGY

:STORICAL PROGRESSION OF SOCIETY'S VIEW OF HANDICAPS"



HUMAN ECOLOGY

DEVELOPMENTAL FACTORS
"BEING GOOD TO YOUR CHILD BEFORE IT'S BORN"

3 Days

Instructional Objectives:

The student should be aware of the need for prenatal care.

Sub-topics:

1. Keeping Well during Pregnancy (p. 5 and 6)
   a. Rest and Sleep
   b. Alcohol
   c. Smoking
   d. Makeup
   e. Exercise
2. Weight Gain and Diet (p. 6,7 and 8)
   a. An Expectant Mother's Food Needs
   b. How Much Weight Should Be Gained
3. Minor Problems of Pregnancy - Warning Signals (p. 9)
4. Things to Avoid...
   a. "don't You Believe It"
   b. Unprescribed Drugs
   c. DATA - Drug/Alcohol/Tobacco/Abuse During Pregnancy
5. Genetic Counseling - (Genetic Counselor Lecture; Health Booklet)

Materials:

1. "Being Good to Your Child" - National Foundation - March of Dimes
2. No-No list of medicines and drugs
3. Unprescribed Drugs - Birth Defects Prevention
4. When You Drink, Your Unborn Baby Does, Too!
5. Genetic Counseling - March of Dimes

What is a drug?

It is any substance used as a medicine or in the preparation of medical or chemical mixtures.

What is a narcotic?

A drug which, even when used in moderate amounts, causes an exaggerated sense of well-being, apathy, drowsiness or sleep. Narcotics also relieve pain.

What is meant by "addiction?"

Many (though not all) frequent users of narcotic drugs, tobacco or alcohol develop a physical dependence—that is, inability to stop abruptly and completely without severe physical suffering. This is known as addiction.

Suppose a woman who is addicted to narcotic drugs becomes pregnant. Can her addiction affect the child?

Yes. Physical dependence on narcotic drugs can be passed on by a mother to her child, with the result that the child may be addicted at birth.

Can cigarette smoking by an expectant mother affect the unborn child?

Yes. A recent report by the Public Health Service cites increasing evidence of "a strong, probably causal association between cigarette smoking and higher late fetal and infant mortality among smokers' infants." This means that stillbirths, and infant deaths occur more frequently among offspring of women who smoke during pregnancy than of those who do not. Smoking during pregnancy tends to reduce the weight of the baby, and low birth weight, in turn, increases the risk of infant death.

What about the effects of alcohol consumption during pregnancy?

Use of alcoholic beverages increases calorie consumption which can have adverse effects both on a pregnant woman and on her unborn child. Alcohol should be taken only as allowed by a physician who knows of the pregnancy.

What other categories of drugs are being widely used?

Hallucinogens, also called psychedelic or "mind-changing" drugs, are among those most widely used. The best-known of these is LSD. These drugs alter the user's sensations and emotions. They include LSD, mescaline, hashish and (when taken in large amounts) marijuana.

Can frequent users of these drugs develop addiction, too?

Not in the medical sense of *physical* dependence. But many doctors believe that frequent and prolonged use of the hallucinogens can cause psychological dependence which results in severe anxiety or restlessness if the user is deprived of the drug abruptly.

Do these mind-changing drugs have any medical value?

Some have been used experimentally by doctors, but none has been approved for routine medical practice.

Can their use affect the unborn child?

Some scientific investigators believe that use of LSD by pregnant women sometimes causes breakage of the chromosomes (the elements that determine heredity), and that this in turn can cause birth defects. According to a statement endorsed by the U.S. Department of Health, Education and Welfare, "Until further research throws more light on the question, medical authorities warn that the drug (LSD) must be considered a definite risk, and women of child-bearing age are particularly advised not to use the drug."

What other kinds of drugs should one look out for?

The so-called "Up" and "Down" drugs are an important category. They include the Amphetamines or "pep" pills; the Barbiturates, which have a calming or sleep-inducing effect; and the Tranquilizers.

Is it safe for a pregnant woman to take these?

No. Not unless they are prescribed by a doctor who knows of her pregnancy.

What about vitamin pills?

Vitamins can be highly beneficial during pregnancy, and are frequently prescribed by doctors. But vitamins that are not prescribed can be harmful if the wrong kind is taken, or the wrong quantity. The question of vitamin pills, and many other kinds of pills, belongs to still another category of drugs—namely, medicinal products or "home remedies" that are legally sold without a prescription and are commonly used without the advice of a physician.

What about all these unprescribed drugs? Can any of them be taken safely by an expectant mother?

No.

Why not?

Any drug, no matter how safe and reliable under other circumstances, could turn out to be harmful to a specific unborn child in a specific mother at a specific time. Medical science hasn't yet determined the answers to this problem. But we all remember, or have heard about, the terrible episode of a decade ago when a new drug – thalidomide – taken by expectant mothers produced severe deformities in their babies. Nobody wants that to happen again—least of all to his or her own child. And there is only one sure way to prevent it.

What way?

Use NO medicines or drugs during pregnancy unless prescribed by the one person who has sufficient information about you and your pregnancy and all the conditions surrounding it. In other words—your doctor.

No unprescribed drugs? But that doesn't mean I can't take a mild laxative during pregnancy if I need one—does it?

No drug of any kind should be taken without asking your doctor. And laxatives are drugs. They may be harmless to you but not to your baby.

Suppose I get a little heartburn, or that "queasy" feeling. Couldn't I take one of those pleasant-tasting digestive aids?

All digestive aids are medicines-drugs. If you have a problem, ask your doctor. And take only what he recommends.

What about aspirin for a headache?

Aspirin is medicine. Pills, tablets, capsules of any kind—all are medicine. None should be taken without the express approval of your doctor.

What about an ointment or salve to soothe an itch, a burn, an insect bite?

Ointments and salves are medicine, too. They can be absorbed into the body through the skin. Your doctor might suggest something you could safely use.

And those sleepless nights—couldn't I take a sedative?

No—not if a doctor who knows you are pregnant hasn't given it to you. A warm shower or sponge bath at bedtime might help you sleep. Or a cup of hot cocoa or warm milk taken after you get into bed. But an unprescribed drug? No.

What about a little wake-up pill when I'm feeling droopy in the daytime?

Definitely not. Wake-up pills, calm-down pills, vitamins, tonics, laxatives, nose drops, cough and cold remedies—they're all medicine. And ANY KIND OF MEDICINE COULD BE HARMFUL unless recommended by a doctor who knows you are pregnant.

Well, okay—but isn't that a pretty strict set of rules for a woman who just wants to have a baby?

You don't "just want to have a baby," do you? You want to have a normal, healthy baby. That means doing everything you possibly can to prevent birth defects. But look at the bright side: If you really need any medication, your doctor will give you what you need. The important thing is to TAKE NOTHING (REPEAT, NOTHING) that is not prescribed for you during your pregnancy.

III-20

DATA

Long ago we used herbs, roots, and fermented juices to treat illness, relieve pain, and promote sociability. Some helped. Some harmed. We still take these items, and thousands of additional chemicals, for the same reasons. Some help. Used carelessly, some harm.

The trouble is we don't always know how, when, how long, or how much medication to take before it starts to harm us. Not knowing is risky for every man, woman, or child. But what if you're pregnant? What about the risks to your unborn baby?

When you take any medicine, you are dosing your unborn baby (fetus) as well as yourself. But its tiny immature body may not react to the chemical as you do. Drugs that comfort you may interrupt your unborn baby's growth or development. Remember, the words, drugs and medicines, apply to over-the-counter remedies as well as to those which require a doctor's prescription.

Pregnancy usually requires no special medicines. Most of the discomforts are temporary and minor. See a doctor early for regular prenatal care and tell him about any unusual symptoms; he will know when and what to prescribe. If your pregnancy is progressing normally, you must be the judge of your "between-visits" needs.

KNOW YOUR DRUG FACTS

Everything you eat or drink gets to your fetus in the same way —through the placenta. This is a thick wall of tissue which provides the baby's nourishment. Some things have difficulty getting past the placenta; others, such as alcohol and many medications, pass through quickly. Some "pile up" in greater concentration in the fetus than in its mother.

Timing: Most birth defects are caused during the first twelve weeks of pregnancy, when a baby's body, arms, legs, and internal organs are being formed. The wrong drug taken at this time could interrupt, or drastically change, part of the baby's development. That same drug taken at some other time in pregnancy might not affect the fetus at all.

TO HAVE OR HAVE NOT

Sodium bicarbonate and other stomach remedies: They relieved your nausea or heartburn before you were pregnant. Why not now? Alkalis, like other salts, may cause water to remain in your body and create swelling in hands or feet. If you have *no* condition that calls for staying away from table salt, one dose of "bicarb," antacid, or other stomach remedy won't hurt you or your baby. Frequent doses, taken for every stomach twinge, could lead to trouble.

Aspirin and other analgesics: In early pregnancy, an occasional aspirin taken with plenty of fluid should not be harmful. Toward the end of pregnancy, however, frequent use may disrupt a baby's blood-clotting mechanism and also cause the same problem in the mother at delivery. There is some evidence that heavy use of aspirin delays normal onset of labor.

Antibiotics: These infection-fighting drugs cross the placenta quickly. Some are used to treat the unborn baby. Others, used carelessly, may damage it. That leftover antibiotic in your medicine cabinet should not be taken just because you have a cold or sore throat. Tetracycline may cause discoloration of your baby's permanent teeth and may affect bone growth. Some sulfa drugs taken in late pregnancy disturb the baby's liver function. If you have a stubborn infection, let a doctor, who knows you are pregnant, prescribe.

Vitamins: Eating a good variety of foods will most likely give you and your fetus the vitamins you need. If you have a vitamin deficiency, a doctor knows the kind and quantity to prescribe. Guessing at your own needs can be dangerous. An excess of certain vitamins may harm your unborn baby.

Laxatives: Constipation can be a problem in pregnancy, but eating fiber foods such as bran cereals, raw vegetables, and fresh fruits can help you. A laxative is a drug, but a mild one used infrequently will not be harmful. If you have a real problem, consult your physician for advice.

Sleeping pills and tranquilizers: Occasional use of a mild barbiturate (sleeping pill), prescribed by a doctor, may do no harm. The use of some tranquilizers has been shown to increase the risk of a baby having a cleft palate.

Narcotics, hallucinogens, and amphetamines: While more study is needed to clarify the effects on the unborn of "street drugs," such as heroin, cocaine, and amphetamines ("speed"), there is no doubt about the destructive force they can have on anyone's health. A pregnant heroin addict can addict her baby, causing it painful withdrawal symptoms at birth. Pregnant addicts also neglect their health because of their drug needs. This increases the risk of having a sick baby.

LSD, peyote (mescaline), hashish, and marijuana, change the user's sensations and emotions. Even if they don't cause physical addiction, they may lead to damaging psychological dependence. All women of childbearing age should understand that drugs, whether hard or soft, pose a possible threat to the health of their unborn babies.

Alcohol: Alcohol passes the placenta quickly. Your unborn baby feels a drink almost as fast as you do. If you're both healthy, an occasional drink will not have any lasting effect on either one of you. But if your fetus is overwhelmed with liquor, his body can be prevented from developing as it should. Children of alcoholic mothers are sometimes born with a pattern of birth defects known as "fetal alcohol syndrome."

Smoking: Mothers who smoke heavily tend to have low-birthweight babies. Newborns who weigh 5½ pounds or less at birth are more likely to develop health problems in early infancy than babies who weigh closer to 7½ pounds. Studies show that many low-birthweight babies have learning problems in school. Many doctors believe that nicotine is directly responsible for stunting fetal growth. Others suspect that since smoking constricts blood circulation in varying degrees, this may deprive the fetus of adequate nutrients through the placenta. Smoking is especially harmful during the second half of pregnancy. Mothers who stop smoking may save their babies from possible damage.

PREGNANCY PLUS DRUGS, ALCOHOL, AND TOBACCO

So much, yet so little is known about the effects of drugs, alcohol, and tobacco in pregnancy. But so much is at stake. Shouldn't you try a "better safe than sorry" approach to your medicine cabinet, your corner bar, or the cigarette machine?

when you drink, your unborn baby does, too

When you're pregnant your unborn baby receives nourishment from you. What you eat, he eats. What you drink, he drinks.

So if you have a drink—beer, wine, or hard liquor—your unborn baby has a drink too. And because he is so small, he is affected twice as fast as you are.

That's the immediate effect. But alcohol can also have serious long-lasting effects on an unborn baby.

how alcohol damages unborn babies

Scientists have found that many children born to women who drink excessively while pregnant have a pattern of physical and mental birth defects. They call the more severe problems the "fetal alcohol syndrome."

Growth deficiency is one of the most prominent symptoms. Affected babies are abnormally small at birth, especially in head size. Unlike many small newborns, these youngsters never catch up to normal growth.

Most affected youngsters have small brains and show degrees of mental deficiency. Many are jittery and poorly coordinated, and have short attention spans and behavioral problems. Evidence to date shows that their IQs do not improve with age.

Fetal alcohol syndrome babies usually have narrow eyes and low nasal bridges with short upturned noses. These facial features make them look more like one another than like their parents or brothers and sisters. Almost half of them have heart defects, which in some cases require heart surgery.

Not every fetal alcohol syndrome baby has all of these defects but there is a relationship between the severity of physical characteristics and the degree of mental impairment. The more severely retarded youngsters are those with the most noticeable physical defects.

many babies are at risk

Fetal alcohol syndrome is a very real problem in the United States today. It is estimated that there are more than one million alcoholic women of childbearing age. And the number is growing—particularly among adolescents.

In some regions, alcoholism in pregnancy has been estimated as the third most common cause of mental retardation.

Babies of teen-agers who drink heavily are in double jeopardy. They may be born too small or too soon because their mothers' bodies are not mature enough to meet the demands of pregnancy. If they also are subjected to excessive alcohol from their mothers, they may suffer some symptoms of fetal alcohol syndrome.

we need to know more . . .

An occasional drink during pregnancy may not harm your baby. But *no one knows* how much alcohol is too much.

That is one of many questions surrounding fetal alcohol syndrome—questions for which researchers throughout the country are trying to find answers. Many of these investigators are aided by the March of Dimes whose aim is to protect the unborn and the newborn.

Scientists know that, as with other things pregnant women eat and drink, alcohol passes through the placenta, the organ which nourishes the unborn baby. The drink the baby gets is as strong as the one the mother takes.

It is believed that the alcohol adversely affects the baby's fast-growing tissues, either killing cells or slowing their growth. Because the brain develops throughout pregnancy, it stands to reason that it is the organ most affected by maternal drinking.

you can prevent this birth defect

Fetal alcohol syndrome is a tragedy. An even worse tragedy is that it *doesn't have to happen!*

If you are a woman of childbearing age, *you can prevent* birth defects caused by excessive use of alcohol.

If you're pregnant, don't drink. If you drink heavily, don't become pregnant.

If you can't stop drinking on your own, seek help before you become pregnant.

ALCOHOL AND PREGNANCY DON'T MIX.

"NO-NO" LIST OF MEDICINES AND DRUGS to be avoided by the Pregnant Woman.

UNLESS RECOMMENDED BY HER PHYSICIAN.

All Liquid Medicines
Pills
Capsules
Laxatives
Aspirin
Reducing Pills
Vitamin Pills
Alcohol
Tobacco
"Pep" Pills
Sedatives
Tranquilizers
Antacids
Cough or Cold Remedies
Nose Drops or Sprays
External Salves or Ointments
Douches
Marijuana or "Psychedelic" Drugs
Narcotics

If your doctor prescribes any of the above, knowing that you are pregnant—OK. Otherwise, best medical advice says "No-No" to any of them during pregnancy.

The National Foundation-March of Dimes
Box 2000/White Plains, New York 10602

3-0029

HUMAN ECOLOGY

Human Genetics

Instructional Objectives:

- The student should be able to indicate the sex chromosome pattern in the human male and female.

- The student should be able to identify traits that are sex linked, and solve problems involving red-green color blindness and hemophilia in humans.

- The student should be able to recognize examples of sex-limited inheritance and predict the effects of hormonal imbalance.

- The student should be able to identify causes and symptoms of phenylketonuria, alcaptonuria, and albinism.

HUMAN ECOLOGY

OBJECTIVE 1

Indicate the sex chromosome pattern in the human male and female.

Introduction

Each body cell in a human has 46 chromosomes, or 23 pairs. Of the 23 pairs, 22 are called the autosomal chromosomes" and are assigned numbers. The last, or 23d, pair is called the "sex chromosomes"; its members are assigned letters. Each body cell of a normal individual has two sex chromosomes, either two X or one X and one Y chromosome. A child whose cells have two X chromosomes is a female; a child whose cells have an X and a Y chromosome is a male. A child's sex is determined at the time of conception, when it inherits its specific sex chromosomes.

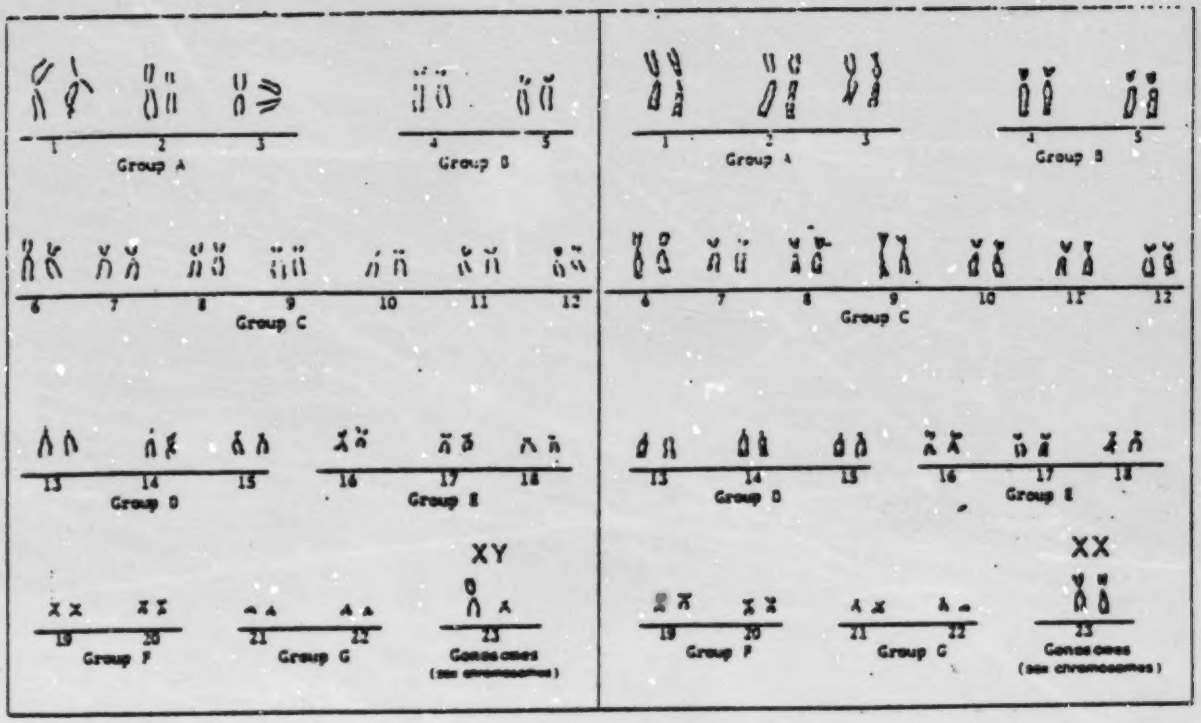


Figure 1. Human male (*left*) and female (*right*) chromosomes, shown in pairs (courtesy of Carol Mortenson)

EXERCISE 1

1 Fill in the Punnett square and indicate the sex of each individual.

	male: X	male: Y	Sex of individual
female: X	1	2	1 / 2
female: X	3	4	3 / 4

2 What is the sex of each of these genotypes?

a. XX
b. XY
c. XO
d. XXY
e. XYY
f. XXX
g. XXXY
h. XXYY

OBJECTIVE 2

Identify traits that are sex linked, and solve problems involving red-green color blindness and hemophilia in humans.

Sex Linkage

Figure 2. X and Y chromosomes

A *gene* is a short length or section of chromosome, influencing a particular set of characteristics in an individual. A gene located on an X or a Y chromosome is said to be *sex-linked*. However, these sex-linked genes themselves may have nothing to do with the sexual traits of an individual. Some of these genes affect color vision, and some affect the clotting of the blood. Mutations of these genes cause such abnormalities as *color blindness* and *hemophilia* (defective blood clotting). Once a mutation occurs, it may be inherited by later generations. Fortunately, most mutations are recessive. Men are more affected by mutated genes on the X chromosome than women are. A woman must have two mutated genes, one on each X chromosome, in order to show the mutation. Why would these last two statements be true?

EXERCISE 2a

Using the following symbols for color vision, complete the Punnett squares. (Within a box, place a normal gene before a color-blind allele.)

X^C = normal gene

X^c = color-blind allele

X^CX^C = normal female

X^CX^c = normal female (a carrier)

X^cX^c = color-blind female

X^CY = normal male

X^cY = color-blind male

1 A normal male is crossed with a carrier female.

female \ male			
	1	2	
	3	4	

Probability of color-blind girls: _____

Probability of girls as carriers: _____

Probability of color-blind boys: _____

2 A color-blind female and a normal male are crossed.

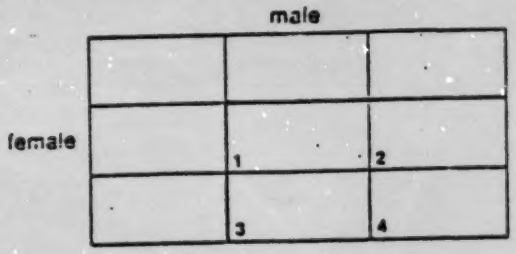
female \ male			
	1	2	
	3	4	

Probability of color-blind girls: _____

Probability of girls as carriers: _____

Probability of color-blind boys: _____

3 A color-blind male and normal (noncarrier) female are crossed.



Probability of color-blind girls:

Probability of girls as carriers:

Probability of color-blind boys:

EXERCISE 2b

Using the following symbols for hemophilia, complete the Punnett squares.

X^H = normal gene

X^h = hemophilic allele

X^HX^H = normal female

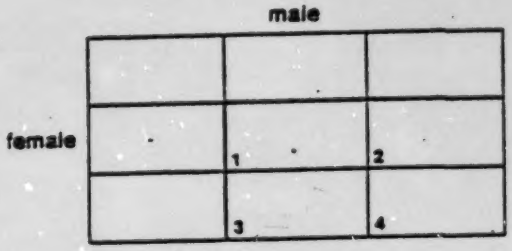
X^HX^h = normal female (a carrier)

X^hX^h = hemophilic female

X^HY = normal male

X^hY = hemophilic male

1 A normal male and a carrier female are crossed.

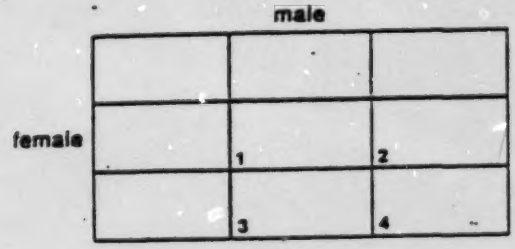


Probability of hemophilic girls:

Probability of girls as carriers:

Probability of hemophilic boys:

2 A hemophilic male is crossed with a hemophilic female. (This is really a theoretical problem, since there are virtually no hemophilic females. A marriage that would produce a hemophilic female is rare, and the occurrence of a hemophilic female is even rarer.)



Probability of hemophilic girls:

Probability of girls as carriers:

Probability of hemophilic boys:

OBJECTIVE 3

Recognize examples of sex-limited inheritance and predict the effects of hormonal imbalance.

Sex-Limited Inheritance

Though both sexes carry the genes for *sex-limited* traits, these traits are expressed in only one of the sexes. The genes for these traits are not sex-linked; they are not found on the X or Y chromosome but rather on the autosomes, or nonsexual chromosomes. The sex-limited genes are responsible for the secondary sexual characteristics found in humans, such as a beard and lower voice in the male and breasts and wider hips in the female. The secondary sexual characteristics are influenced by *hormones*, which are organic substances secreted by certain glands directly into the bloodstream and carried to other parts of the body.

EXERCISE 3

Predict what might happen in each of the following situations.

1 Over an extended period of time, a female receives excessive amounts of a male hormone, testosterone, to offset a hormonal imbalance at the time of the menopause.

2 A tomcat is given injections of female hormones for a period of time and is then placed with a litter of kittens.

3 Beef steers gain weight fast when they are fed the female hormone diethylstilbestrol. The men who first mixed this hormone with the feed took few precautions while handling it. As a result, some of the men absorbed considerable amounts of diethylstilbestrol through their skin and lungs.

OBJECTIVE 4

Identify causes and symptoms of phenylketonuria, alcaptonuria, and albinism.

Diseases Due to Lack of Enzymes

Certain diseases are recessively inherited traits, caused by mutations or changes in specific genes. For instance, if genes that control the production of *enzymes* are altered, the proper enzymes will not be produced in the body. Then specific metabolic reactions will not take place. Enzymes are complex organic compounds formed by the cells; they function to catalyze or control chemical reactions in the body.

Figure 3 shows the body's normal pathway for processing the amino acid phenylalanine. Amino-acid molecules are fundamental to life because hundreds of them combine to make up each protein molecule—they are the building blocks of proteins. If the normal pathways for processing any one of the amino acids are blocked, the body must find other and less satisfactory means of

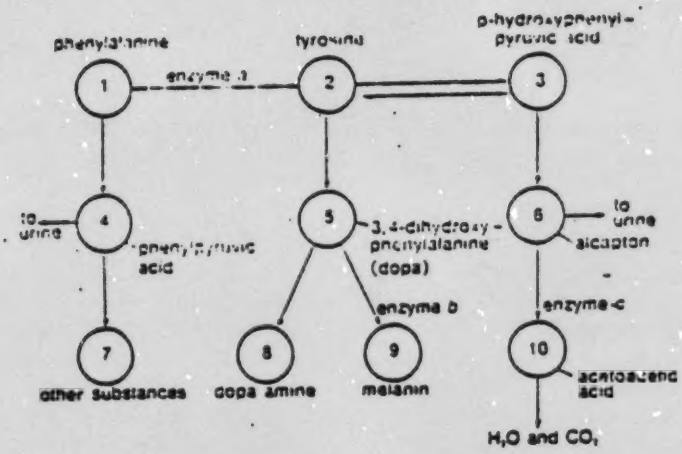


Figure 3. Metabolic pathway of phenylalanine

Phenylketonuria (PKU)

Phenylalanine is one of about 20 amino acids found in the proteins we eat. Milk, the sole food for newborn infants, is especially abundant in phenylalanine. When the enzyme that converts phenylalanine to tyrosine (another amino acid) is missing in an infant, the metabolic pathway for phenylalanine is diverted to phenylpyruvic acid. The results are most unfortunate, since the individual may become mentally retarded.

Figure 4. A PKU child. Blond hair, very fair skin, and mental retardation are typical symptoms. (courtesy of Dr. Peter Cohen, M.D., Dept. of Pediatrics, University of California Medical Center, San Francisco)

Alcaptonuria

When alcapton is not converted into acetoacetic acid, it accumulates in the body and much is excreted in the urine. When urine containing alcapton is exposed to air, the urine turns black. Alcapton also accumulates in the cartilaginous parts of the body, such as the ear, resulting in blackened ears.

Figure 5. Alcaptonuric ear. Note the blackened cartilage, a typical symptom, inside the ear. (courtesy of Dr. James B. Wyngaarden, Dept. of Medicine, Duke University Medical Center)

Albinism

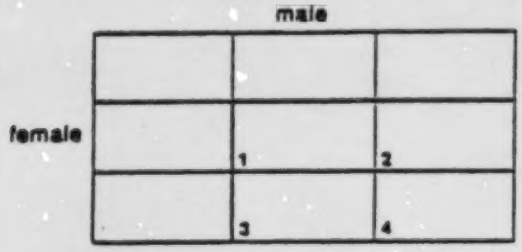
If 3,4-dihydroxyphenylalanine (dopa) cannot be converted to melanin because enzyme *b* is missing, no pigment can be formed in the skin, eyes, or hair. Regardless of the race of an individual, his skin and hair will be very white. The iris of the eye will look pink because the capillaries of the circulatory system can be seen. Normally the capillaries are covered by the pigment of the iris.

Figure 6. Albino child with his two older, normal brothers. Note the very white skin and hair, typical symptoms of albinism. (courtesy of Victor A. McKusick, M.D., Johns Hopkins University School of Medicine)

EXERCISE 4

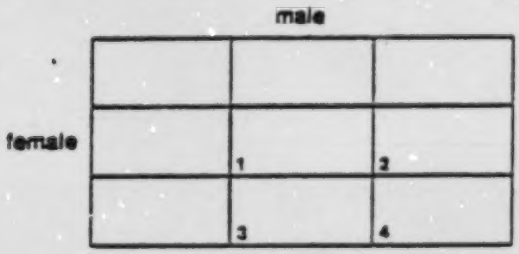
Complete the following crosses, where *PP* = pigmented and *pp* = albino allele.

Cross 1 *PP* pigmented man with *pp* albino woman



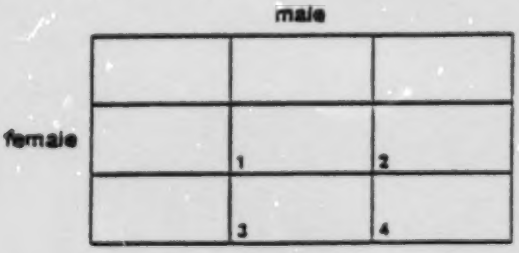
Proportion of albino children to pigmented children:

Cross 2 *Pp* pigmented man with *Pp* pigmented woman



Proportion of albino children to pigmented children:

Cross 3 *Pp* pigmented man with *PP* pigmented woman



Proportion of albino children to pigmented children:

HUMAN ECOLOGY

Human Genetics

Instructional Objectives:

Upon completion of this minicourse, you should be able to:

5. define the term nondisjunction and recognize examples of this phenomenon.

6. identify symptoms of Turner's syndrome and Klinefelter's syndrome, and recognize the inheritance mechanisms for each.

7. identify symptoms of Down's syndrome, and recognize the inheritance mechanism for it.

8. indicate how Barr bodies can be used in the determination of sex.

OBJECTIVE 5

Define the term *nondisjunction* and recognize examples of this phenomenon.

Nondisjunction Abnormalities

Nondisjunction occurs in either males or females during the first or second meiotic divisions, when for some reason the two-chromatid chromosomes do not separate or a chromosome is pulled to the wrong end of the cell. If nondisjunction occurs in the first meiotic division, the chromosomes fail to be pulled apart normally at anaphase I. If nondisjunction occurs in the second meiotic division, the chromatids fail to be separated properly at anaphase II.

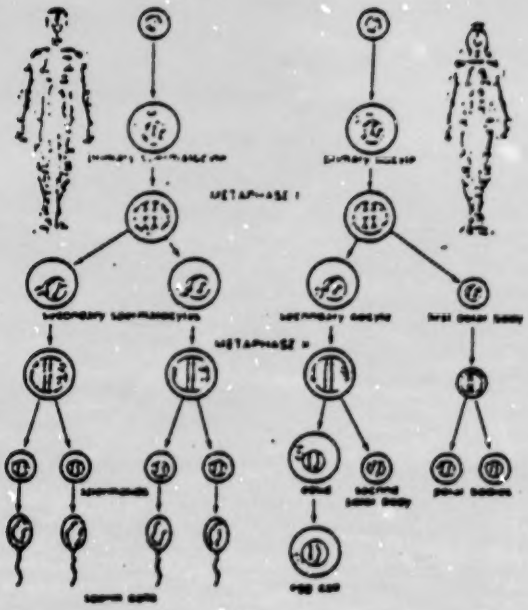
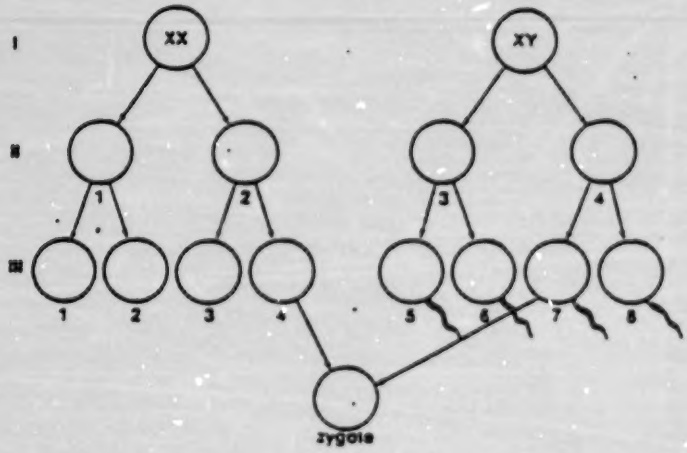


Figure 7. Normal meiosis (adapted from *Human Heredity and Birth Defects*, by E. Peter Volpe, copyright © 1971, by The Bobbs-Merrill Company, Inc. Reprinted by permission of the publisher)

EXERCISE 5

Show how an individual could obtain an XYY chromosome complement.



OBJECTIVE 6

Identify symptoms of Turner's syndrome and Klinefelter's syndrome, and recognize the inheritance mechanisms for each.

Nondisjunction of the Sex Chromosomes

Various abnormalities can occur because of nondisjunction of the sex chromosomes in either the male or female gametes. Figure 8 illustrates nondisjunction in the female.

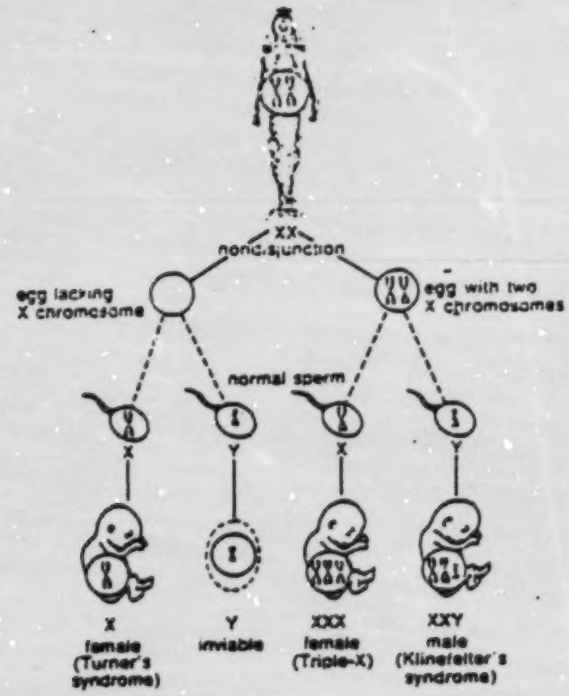


Figure 8. Nondisjunction in the female (adapted from *Human Heredity and Birth Defects*, by E. Peter Volpe, copyright © 1971, by The Bobbs-Merrill Company, Inc. Reprinted by permission of the publisher)

Turner's Syndrome

Individuals with an XO chromosome complement are female, since there is no Y chromosome present. They are usually sterile and as children have a webbed neck. This type of female occurs in about 1 out of every 25,000 births.

re 9. Female child with Turner's syndrome. Note the wide, flared (webbed) neck, a typical symptom. (Armed Forces Institute of Pathology photo)

OBJECTIVE 7

Identify symptoms of Down's syndrome, and recognize the inheritance mechanism for it.

Nondisjunction of the Autosomal Chromosomes: Down's Syndrome

Individuals exhibiting Down's syndrome can be either male or female, since the sex chromosomes are not involved. Nondisjunction occurs in the 21st chromosome. An individual with Down's syndrome has an extra 21st chromosome. Women past 40 years of age who give birth to a baby have 150 chances in 10,000 of having a baby with Down's syndrome. Women under 32 years of age very seldom have a baby with Down's syndrome. The occurrence for all ages is 16 out of 10,000 births.

Figure 11. A four-year-old child with Down's syndrome. Note the eye fold, the flattened nasal bridge, and the small eyes. (courtesy of Dr. Peter Cohen, M.D., Dept. of Pediatrics, University of California Medical Center, San Francisco)

Figure 12.
Hand and foot of an infant with Down's syndrome. Note the single crease that stretches across the entire palm of the hand. Note also the wide gap between the first and second toes of the foot. (courtesy of Dr. Bryan D. Hall, University of California School of Medicine, San Francisco)

EXERCISE 7

Older parents of a newborn child with Down's syndrome were discussing how their child had inherited the extra chromosome. The mother said that the extra chromosome had come from the father, and the father said it had come from the mother. Who was probably correct? Explain your answer.

OBJECTIVE 8

Indicate how Barr bodies can be used in the determination of sex.

Barr Bodies

ch cell of a female has two X chromosomes, with a dark spot called a Barr body in the nucleus. The Barr body is derived from one of the two X chromosomes. The number of Barr bodies will always be one less than the number of X chromosomes. Each cell of a normal female would have one Barr body, while each cell of an XXX female would have two Barr bodies. A male would have no Barr bodies, since each of his cells has only one X chromosome.

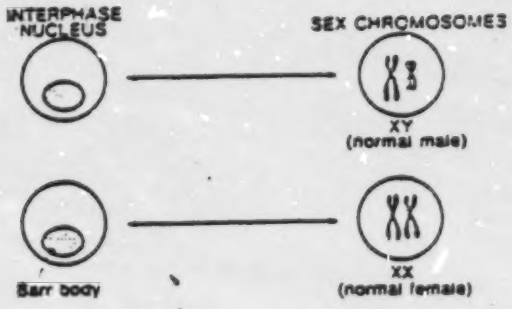


Figure 13. The Barr body

EXERCISE 8

Barr bodies can be used to determine whether a female is a normal XX woman. hould a woman participating in women's athletic events be allowed to continue if her cells show no Barr bodies? Give reasons for your answer. (Recall testicular feminization.)

HUMAN ECOLOGY

HUMAN GENETICS

Instructional Objectives:

Upon completion of this investigation, you should be able to:

9. explain how sickle-cell anemia is transmitted in human population.

10. realize that even though there is a strong selection against the sickle-cell gene, it still exists in a relatively high frequency in some parts of the world.

11. describe what a mutation is on a molecular basis.

12. explain how a mutation which would normally be a detriment could be an advantage under certain condition.

INVESTIGATION 16

The Human Species

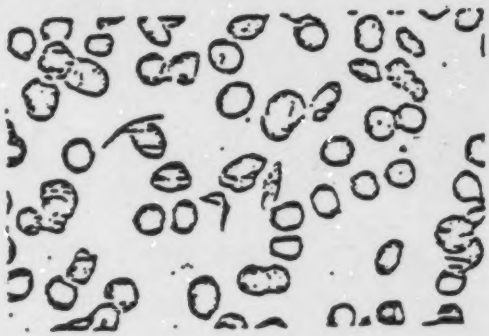
16-A

A Blood Abnormality in the Human Population

What is the significance of the variations in blood types? Does each variation provide some special advantage to its carrier? These questions are of particular interest to biologists. The modern human species has developed over 40 to 60 thousand years or more, and biologists assume that most variations within the species have some survival value. But could this include even variations that cause diseases? Could a blood disease like *sickle-cell anemia* have survival value? If so, under what circumstances could the disease be an advantage to people?

Sickle-cell anemia is a disease in which the red blood cells become sickle-shaped when their oxygen supply is low. Even if they later receive oxygen, the sickle-shaped cells do not return to normal. If enough of the sickle cells block capillaries and stop the flow of blood and oxygen, the patient will die. Figure 16-A-1 shows sickle-shaped cells with normal red blood cells.

Figure 16-A-1 Red blood cells of a person with sickle-cell anemia. At low oxygen concentrations, many more of the normally disk-shaped cells become sickle-shaped (see Figure 16-1J).



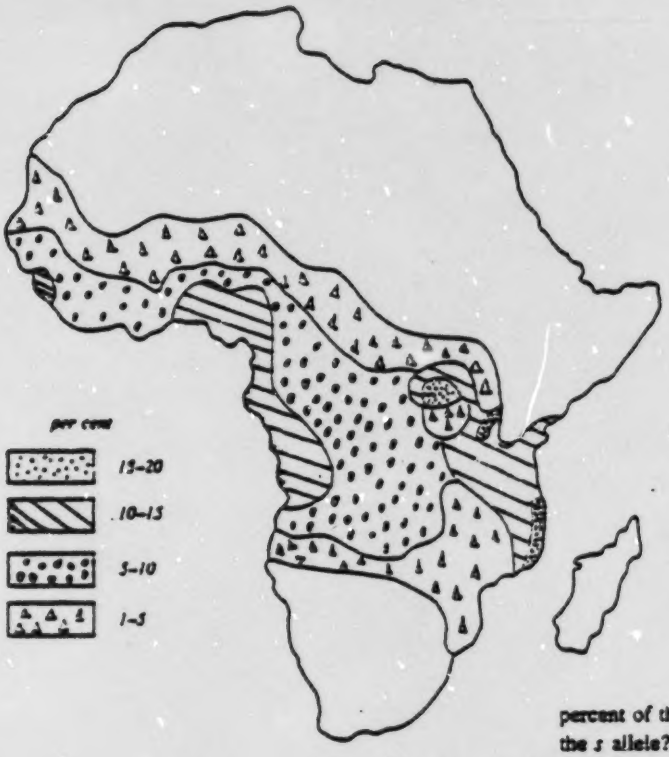


Figure 16–A–2 Frequency of the gene causing sickle-cell anemia, plotted as percentages of the population gene pool in parts of Africa.

PROCEDURE

1. Sickle-cell anemia is due to a certain gene (symbol: *s*) when it is present in the homozygous condition. What are the three possible genotypes involving this gene and its normal allele? (Use *S* to represent the normal allele.)
2. What phenotypes would be associated with each genotype you mentioned in answer to question 1?
3. About one-quarter of one percent (0.25%) of American blacks are homozygous (*ss*) for this gene. On this basis what percent of the black population is heterozygous for the *s* allele? Review the Hardy-Weinberg principle in Section 15–6.
4. In Africa about 4 percent of the members of certain tribes have sickle-cell anemia. What percent of this population is heterozygous for the *s* allele?
5. The Hardy-Weinberg principle enables us to predict when the gene frequencies in a population will remain constant. Would you expect the frequency of the *s* gene to remain constant? Because people with sickle-cell anemia usually die in childhood, the frequency of the gene causing this disease might not remain constant. Each death removes a pair of the sickle-cell-causing genes from the population. Nevertheless, your answer to question 4 showed that a high percentage of certain populations is heterozygous for the gene that causes sickle cells. Why does the frequency of this gene remain so high?
6. Figure 16–A–2 shows the locations in Africa where the gene frequency of the *s* gene is highest. These locations are also the areas where a fatal form of malaria is found. Study

of the evidence reveals that the gene causing sickle cells offers some protection against malaria. Refer to the genotypes you gave in answer to question 1. What are the advantages and disadvantages of having each of these three genotypes? Which genotype would you select as having survival value?

7. Consider that in Africa both of the homozygous genotypes could be fatal conditions, one because of malaria and the other because of sickle-cell anemia. Which genotype would tend to survive? What would be the gene frequencies of *s* and *S* in a population made up of this surviving genotype?
8. The gene frequencies in the African populations under discussion are not 0.5 for each gene, as you calculated in Procedure step 7. Considering that fact, do you think the assumption in step 7 is reasonable? Which genotype do you think is less likely to be fatal?
9. How can you explain the lower frequency of the gene causing sickle cells among American blacks? (See your answer to question 3.)
10. The sickle-shaped red blood cell is caused by a mutation that affects the hemoglobin in the sickle cells. Hemoglobin is a protein substance and, therefore, made of amino acids. Scientists have been able to compare the chemical structure of normal hemoglobin, hemoglobin A, with the kind of hemoglobin found in sickle cells, hemoglobin S. They found that both types of hemoglobin molecules contain 560 amino acids of 19 different kinds. Figure 16–A–3 shows that the two molecules are identical except at one point where there is a different sequence of amino acids. What is the significant molecular difference between hemoglobin A and hemoglobin S?
11. Notice that the substitution of a single amino acid within this molecule causes a significant difference in the behavior of the molecule.

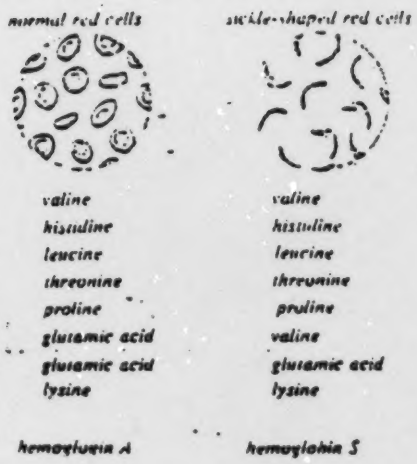


Figure 16–A–3 Amino acid sequences compared for normal and sickle hemoglobin in the portion of the one polypeptide affected.

What are the nucleotide codes for the two amino acids that make the difference between hemoglobin A and hemoglobin S? Consult the genetic code table in Appendix 9–A. What is the simplest mistake in coding that could have occurred to cause the mutation?

DISCUSSION

Write a few paragraphs to summarize sickle-cell anemia. Emphasize the ideas of mutation, selection, survival value, and evolution.

16–B

Variation in the Human Species

Variability is a basic characteristic of living things. Reserves of genetic variability are what natural selection acts on as a species meets changes in its environment.

Human beings show variation in many traits that can often be detected easily by phenotype or appearance. Some of these traits may persist partly

PSYCHOLOGICAL DE VELOPMENT

HUMAN ECOLOGY

PSYCHOLOGY SECTION

Values Clarification - Lesson 1

Instructional Objectives:

The student will:

1. become aware of values and attitudes of peers.
2. examine the reasons for their values and attitudes.

A QUESTION OF VALUES

One evening you invite eight acquaintances to your home to talk with a psychology professor whom you know personally. In the midst of your discussion, you hear the air raid siren. You turn on the radio and the Civil Defense station broadcasts that enemy planes are approaching. Fortunately, you have a well-equipped bomb shelter, a terrific blast shakes the earth and you realize that the bomb has fallen. For four frantic hours you get static on the radio in your shelter. Finally you hear the following announcement:

"A bomb of great magnitude has hit the immediate area. Damage is extensive; radiation is intense. It is feared that all those not in shelters have suffered a fatal dose of radiation. All persons in shelters are warned that it would be fatal to leave before at least a month. Further bombing is anticipated. This may be the last broadcast you will hear for some time."

Immediately you realize that you have eleven persons is a shelter which is equipped with food, water, and most important, oxygen enough to last eleven people two weeks or six persons for a month. When you reveal this information, the group unanimously decides that in order for anyone to survive, five must be sacrificed. As it is your shelter, all agree that you must stay and choose the other five who are to be saved.

WHOM WILL YOU CHOOSE?

In making your survival decisions, your ideas must be guided by four things:

1) Accept this hypothetical situation as a fact. Concern yourself with choosing your companions, not with attaching the logic or probability of the situation.

2) Be practical. You must stay in the shelter. Your physical, moral, spiritual, cultural and social survival will depend on your companions--their abilities and personalities.

3) Accept all facts concerning the ten persons as actual; overlook neither their strengths nor weaknesses. You may assume nothing about the characters which would conflict with what you have been told.

4) Do not overlook your own strengths and weaknesses in making your choice. Remember that you are one of the six.

5) One final word: There are no right or wrong answers to this survival problem. The important thing is to be able to support your choices with specific reasons.

THE TEN PEOPLE

1) Mary, the psychology professor, is a few years older than the rest of the group. It has already become evident that the others respect her and recognize her grasp of the situation and her ability to take control. Although she is rather cold and impersonal, she has helped to quiet the group's nervousness and has settled an argument between Don and Hazel. Even though no one seems close to her, you feel she would be valuable as an organizer and pacifier.

2) Hazel is studying home economics, nutrition and dietetics. She is a very sexy, attractive girl. One of the first things she did was to appraise the food supply. You realize that her training has given her practical knowledge of how to ration food to avoid waste; also, she is an imaginative cook who can fix even canned food appealingly. She is efficient, to the point of being domineering and bossy.

3) Alberta is a brilliant girl who has been given a graduate assistantship to do research on radiation. She has been pampered all her life and is horrified at wearing the same clothes for a month, being unable to take a bath or wash her hair, and sleeping in a room with five other people. Her scientific knowledge of the situation would be a definite asset; her whim and attitude would be trying.

4) Laura is a literature major, has read extensively, and writes well herself. Already she has entertained and diverted the group by retelling one of the books she has recently read.

5) Nancy, Chet's wife, has a pleasant personality generally. However, she has been the most nervous and upset of the group. Her tempermental, excitable mood is partially due to the fact that she is expecting a baby in two months.

6) Chet, Nancy's husband, is a medical student. He has had two years of medical study, three summers in a camp as medical director, and close association with his father, who is a doctor. You realize he would be a great aid; however, he refuses to stay unless Nancy also remains.

7) Jack, the mechanic who has been working upstairs, also has a great deal of practical know-how to recommend him. Although his formal education ended with high school, he has had experience with air-filtration systems, air purifiers, and oxygen supply. He is a rather dull, chubby fellow. He has already been reprimanded by Hazel for snitching a Hershey bar from the limited food supply. Despite his understanding of the technical aspects, he fails to grasp the necessity for self-control as far as the food and water supply is concerned.

8) Paul, a young minister, is easy going. His calmness, optimism, and faith are an inspiration to the group. In an intangible, yet perceptible way, his presence is reassuring. He helped quiet Nancy's tearful outburst. At this time, he revealed that he has learned to remain calm, of necessity, because he is diabetic. He would require special diet and easily becomes tired. Overexcitement causes him to faint.

9) Joe is a clean-cut, husky Black football player, the star center of the college's team. He is highly respected by everyone on campus. Joe was the only one able to lift the heavy metal plate that had to be placed over the shelter door. At one point, when Chet took it upon himself to set the oxygen tank valve, Jack flew at him, shoved him out of the way, and reset the valve properly. A fist fight might have ensued had Joe not parted the two.

10) Don is a gay romantic. His smile, lively guitar music and acintillating sense of humor have helped improve everyone's mood. He gets along well with everyone--too well with some of the girls. He has already offended Hazel by being fresh, and several of the girls have noticed his flirting eyes darting from face to face as he sings.

"WHO SHOULD SURVIVE?"

The following 15 persons are in an atomic fallout shelter. An atomic attack has occured. These 15 persons are the only humans alive on earth. It will take two weeks for the external radiation levels to drop to a safe survival level. The food and supplies in the shelter can sustain, at a very low level, seven persons for two weeks. In brief, only seven persons can survive. It is the task of your group to decide the seven persons who will survive. The group decision must be unanimous.

1. Mr. Dane	39, Religion-no affiliation, Ph.D. in history, college professor, good health, married-1child (Bobby), active in community. White.
2. Mrs. Dane	38, Jewish, AB and MA in Psychology, Counselor in Mental Health Clinic, good health, married-1 child (Bobby), active in community. White.
3. Bobby Dane	10, Jewish, Special Ed. classes for 4 years, mentally retarded, IQ 70, good health, enjoys his pets. White.
4. Mrs. Garcia	35, Spanish-American, Roman-Catholic, 9th grade education, Cocktail waitress, prostitute, good health, married at 15, divorced at 18, abandoned as a child, in a foster home as a youth, attacked by foster father at age 12, ran away from home, returned to reformatory, stayed till 16, 1 child 3 weeks old (Joan).
5. Joan Garcia	3 weeks old, good health, nursing for food.
6. Mrs. Evans	32, Protestant, ABand MA in Elementary Education, teacher, divorced, 1 child (Mary), good health, cited as an outstanding teacher, enjoys working with children. Black.
7. Mary Evens	8, Protestant, 3rd grade, good health, excellent student. Black.
8. John Jacobs	13, Protestant, 6th grade, good health, excellent student. White.
9. Mr. Newton	25, claims to be an athiest, starting last year of medical school, suspended, homosexual activity, good health, seems bitter concerning racial problems, wears hippie clothes. Black.

10. Mr. Clark	28, Protestant, College graduate, engineering electronics engineer, married, no children, good health, enjoys outdoor sports and stereo equipment, grew up in a ghetto. Black.
11. Sister Mary Kathleen	27, Nun, College graduate, English major, grew up in upper middle class neighborhood, good health, father was a businessman. White.
12. Mr. Blake	51, Morman, BS graduate, mechanic, "Mr. Fix-It," married, 4 children (not with him), good health, enjoys outdoors and working in his shop. White.
13. Miss Allen	21, Spanish-American, Protestant, college senior, majored in nursing, good health, enjoys outdoor sports, likes people.
14. Father Evens	37, Catholic Priest, college plus seminary, active in civil rights, criticized for liberal views, good helath, former college athlete. White
15. Dr. Gonzales	66, Spanish-American, Catholic, Medical Doctor, General Practitioner, has had two heart attacks in past 5 years, but continues to practice.

HUMAN ECOLOGY

EFFECTS OF DRUGS - MARIJUANA

Lesson 2

Instructional Objectives:

The student will:

1. become aware of parental attitudes toward the use of marijuana.
2. understand the difficulty in dissuading someone from using marijuana.
3. understand the rationale for use of marijuana.
4. become aware of the emotional and physical effects of marijuana use.

Materials:

None

Activities:

Speaker

Evaluation:

Short answer test items on effects of marijuana use.

EFFECTS OF ALCOHOLISM ON THE FAMILY

2 Days

Instructional Objectives:

The student will:

1. become aware of the effects of alcoholism on the family
2. become aware of ways in which family members can seek help

Materials:

Film - "Alcoholism and the Family" - Father Martin

Survey finds state school children use alcohol, drugs

Continued from A-1

ongoing medical and social prob-

The study was conducted in April & May among 1,591 students in Cape Henlopen district in Sussex unty, the Capitol District in Kent unty and the New Castle County hool District. It was conducted by e university's College of Urban fairs and Public Policy for DHAL, drug and alcohol resource center.

Robert A. Wilson, who directed e study, said the results indicate ost the number of kids who drink gularly. It doesn't necessarily can they're drinking a lot."

Wilson said the report includes ose students who said they drink ore a week or more and those who rink once a week or less often.

"When you talk about excessive smoking you're talking about three o five drinks or more a day," he aid. "Like the national studies and f the kids who drink, about 5 percent of them are heavy drinkers. That's a much smaller number, but still a significant number of kids who have an alcohol problem."

Students in grades 6, 9 and 11 in the three districts answered a questionnaire on their use of alcohol, cigarettes and several other legal and illegal drugs.

The results parallel national statistics where they are available, Wilson said. "It's important to note that, because people might think there is an epidemic in Delaware and that's not so," he said.

Still, the figures show a substantial increase in drug use since a study was conducted in 1971, also by Wilson. That study, which separated Wilmington from the three counties, showed the highest rate of drug use was 11 percent, in Wilmington. The use of alcohol and cigarettes were not included in the 1971 survey.

The new survey, which is based on a smaller sample than the earlier one, shows that less than 10 percent of sixth-graders use marijuana, but by the 11th grade the number has jumped to more than 10 percent, which means that more juniors are now smoking marijuana than cigarettes.

National figures show that by age 25, seven out of 10 people smoke marijuana, the report says.

In the 11th grade only about 23 percent of the students ... they smoke cigarettes, but b... down by sex, the figures show that more

young...

Results from the survey

The students who drink alcohol . . .

	Cape Henlopen	Capitol	New Castle	Total
6th Grade				
Male	27.1%	32.3%	31.9%	30.3%
Female	18.4%	12.8%	32.4%	20.0%
9th Grade				
Male	42.4%	58.5%	64.7%	61.5%
Female	55.9%	56.6%	64.6%	57.8%
11th Grade				
Male	73.2%	62.2%	77.1%	70.6%
Female	64.8%	60.5%	71.0%	68.1%

. . . smoke cigarettes . . .

6th Grade				
Male	1.0%	16.8%	13.2%	10.6%
Female	2.8%	6.4%	10.6%	6.0%
9th Grade				
Male	14.1%	13.8%	26.5%	16.2%
Female	24.3%	27.8%	30.0%	28.6%
11th Grade				
Male	18.7%	17.0%	22.5%	19.2%
Female	31.1%	26.9%	26.7%	26.8%

. . . and use marijuana

6th Grade				
Male	1.0%	14.3%	8.7%	7.8%
Female	1.9%	1.1%	1.5%	1.5%
9th Grade				
Male	22.0%	37.9%	35.3%	29.5%
Female	23.3%	25.4%	29.4%	25.4%
11th Grade				
Male	44.1%	41.6%	49.3%	44.6%
Female	39.4%	43.4%	38.9%	40.7%

the boys smoke and 6 percent of the girls smoke. In the ninth grade, 16.2 percent of the boys smoke and 28 percent of the girls do. By 11th grade, 28.8 percent of the girls smoke, compared with 19.2 percent of the boys.

"That indicates a whole new health-risk area," said Barbara Morgan, director of DHAL. She said agencies such as the Cancer Society and the Lung Association might use the data to target non-smoking campaigns to women.

Broken down by race, the study indicates that all drug use among white students is much greater than among blacks or Hispanics.

On the use of heroin, the report questions its own statistics because the fluctuation by grade suggests "a lack of reliability of the data." It shows that heroin is used by 0.5 percent of the sixth-grade boys surveyed and none of the girls; 2.3 percent of the ninth-grade boys and ... of the ... grade ... 3 ... grade ... about ...

Other drugs and their current use by grade:

- Amphetamines — Less than 3 percent of sixth-graders; about 12 percent of ninth-graders and about 12 percent of 11th-graders.
- Barbiturates — Less than 3 percent of sixth-graders; about 6 percent of ninth-graders and about 12 percent of 11th-graders.
- Non-prescribed Valium or Librium — Less than 3 percent in the sixth grade; about 5 percent in the ninth grade and just over 7 percent in the 11th grade.
- LSD — About 2 percent in the sixth grade; about 4 percent in the ninth grade and about 7 percent in the 11th grade.
- Laughing gas — about 3 percent in sixth grade, about 4 percent in ninth grade and about 5 percent in 11th grade.
- Opiate-based narcotics — about 12 percent in sixth and ninth grade and about 15 percent in 11th grade.

... about 4 percent in ninth grade and less than 3 percent in 11th grade.

Superintendents of the three school districts in the survey were surprised and concerned about the results of the survey, particularly the high use of alcohol among younger children.

F. Stephenson Matthes, superintendent of the Cape Henlopen district since September, said the finding that 25 percent of sixth-graders use alcohol regularly is "very difficult to believe, but if it's true, I'll bet it's under the direct observation of their parents." He said it may be that students indicated the use of alcohol when they drink "a little wine" on special occasions at home.

He also questioned the validity of the survey because it was given to the students in the form of a questionnaire that they could answer anonymously. "I always have a question when people give children a pencil and paper," he said. "I know children. They'd love to put down anything they want to."

The report acknowledges that "some students undoubtedly misreport drug use patterns in self-administered questionnaires," but it says that studies have validated such surveys.

A greater number of questionnaires were counted in the Cape Henlopen and Capitol school districts than in New Castle County, "because we didn't get as many back from New Castle County," Wilson said, "but that sample size still is accurate for the whole population."

"It doesn't surprise me that younger people are using alcohol," said Edward W. Coute, superintendent of the Capitol School District. "But I'm a little surprised about the sixth grade."

"The phenomenon [of drug abuse] seems to be going in that direction," he said. "Pills mixed with alcohol seem to be the trend".

He attributed it partly to "accessibility in the homes and from older children. I think the young people who go to a party probably will be influenced more by somebody who is drinking than by somebody who is smoking dope. I'm sorry to say, I think it is the social acceptance. It is a legal substance and there is no doubt about it that a parent who says, 'Oh, thank God he's only drinking' shows it's the socially acceptable thing."

Coute said health classes in his district conduct a drug education program. There are no plans to change the program now, he said, "but it is probably a good time to reevaluate in light of new statistics."

The drug abuse education program is undergoing reevaluation now in the New Castle County School District, said Superintendent George V. Kirk.

The use of alcohol by younger children "seems to be a pattern developing over the past several years, partly because parents have been so concerned about the other drugs, they put less pressure on use of alcohol."

In past years, he said, many drug education programs focused on marijuana and used "horror stories, excessive statements that youngsters found out from other people were being exaggerated."

"It was well meant, but those kinds of things made the programs lose credibility," he said.

Questionnaires were distributed through the superintendents' offices of the three districts to the principals of the schools involved. Parents who did not want their children included were invited to withdraw them from the study.

Classes were randomly sampled in all schools in Cape Henlopen and Capitol districts with sixth, ninth and 11th grades, and in 12 schools in the New Castle County School District. The report says the survey is accurate to within three percentage points.

BEGINNING OF ARTICLE

6th-graders admit they use alcohol

By ANITA MANNING
Staff reporter

A study by the University of Delaware of drug and alcohol use among students in three school districts of Delaware shows that 25 percent of the sixth-graders surveyed say they drink alcohol regularly.

In the ninth grade, more than half the students surveyed said they are regular users of alcohol, and about 70 percent of the 11th-graders reported the same thing.

"A substantial number of Delaware students uses drugs and alcohol in a manner which poses a serious mental and physical health risk," the study concludes. It emphasizes the need for early detection of drug problems, and for prevention programs that give accurate information about drugs and teach students how to make decisions about drugs.

"The drug crisis of the 1970s has not vanished," the report says. "In fact, it appears to have turned into

See SURVEY — A-8

IV-9

Amniocentesis is already being used to detect chromosome defects in unborn children. Cells can be isolated from the amniotic fluid. Then karyotypes can be prepared from the cells. In this way, diseases such as Down's syndrome can be identified. At present, very little can be done to correct these defects. However, in the future, maybe they can be treated before the child is born.

Genetic counseling is available to prospective parents from families with a history of hereditary disease. The genetic counselor can advise the parents about the chances of their offspring being born with the disease. As a result of genetic counseling, some couples may choose not to have children. Thus, children with incurable diseases would not be born. Genetic counseling will probably become more common in the future.

Assuming that someday genetic engineering becomes possible, there are several moral questions. Should humans create life artificially? Should they design other human beings according to their whims? Is it wise to increase the size of an already exploding population? Who will be entrusted with making the decisions about the kinds and numbers of humans? Is too much knowledge dangerous to the human species? These are difficult questions.

Humans are the most complex of all organisms. Their biological gifts of reason and intelligence have enabled them to put men on the moon. However, use of these same gifts has resulted in ecological problems. Fortunately, people have come to realize the results of pollution, poor conservation methods, and overpopulation. Scientists and nonscientists alike are becoming aware of and concerned about these problems. A new spirit of cooperation, planning, and thoughtfulness has arisen. Hopefully, humans will continue to use their gifts

HUMAN ECOLOGY

TERMS AND CONCEPTS

Motivation:

homeostasis
hypothalamus
drives
deprivation of dreaming
drive reduction stage
difference between physically based motivation of animals and humans
curiosity
surrogate monkey experiment demonstration
cognitive theory of motivation
4 stages of motivation
Ex. approach - approach conflict
Ex. approach - avoidance conflict
learned motivation of fear
Eileen's strong achievement drive
functional autonomy
drive to avoid achievement

Suicide:

clues and warnings
suicide risks
mental illness and suicide
reasons for - causes
chronic suicide
"cry for help"
frequency
sources of help
ways to deal with

Neurosis - Psychosis:

persistant anxiety
obsession
compulsion
phobia
anxiety
hypochondria
depression
hysteria - conversion reaction dissociative reaction
senility
manic - depressive
paranoia
schizophrenia
catatonia
hebephrenia

HUMAN ECOLOGY

ENVIRONMENTAL FACTORS

Lesson 3 - Energy

6 Days

Instructional Objectives:

Upon completion of this lesson, the student should be able to:

1. read an electric meter.
2. list all the electrical appliances in his home.
3. compare energy use in the United States with other nations.
4. indicate the role of which we increase our energy use.
5. explain exponential growth.
6. list five reasons for the increased energy use.
7. list 3 reasons for the United States shifting away from using coal as its major energy supply.
8. explain how the energy growth rate and population explosion are related.
9. construct and interpret a line or bar graph on Total Energy Consumption and on Total Energy Consumed per Capita
10. describe how a nuclear reactor can produce electricity.
11. name four advantages and three disadvantages to developing the nuclear option.
12. locate on a map the nuclear power plants which supply energy to Delaware.
13. explain the state of development nuclear fusion is in.
14. name four energy sources of the future, i.e. wind, geothermal, waste and solar and discuss the advantages and disadvantages of each.

Materials:

1. sheet on "How to Read an Electric Meter."
2. reading: "Our Present Energy Situation - How We Got There".
3. investigation: "The Nuclear Controversy".
4. investigation: "Our Energy Growth Rate and Its Implications"
5. reading: "Energy Sources of the Future".
6. worksheet: "Congressional Hearing: The Energy Crisis".

HUMAN ECOLOGY

ABNORMAL BEHAVIOR

Lesson 8

Instructional Objectives:

The student will:

1. be able to identify the ways in which society defines normal/abnormal.
2. be able to identify symptoms of poor adjustment and healthy adjustment.
3. become aware of different attitudes towards normality.

Materials:

Text: Psychology For You - Chapter 2

Text: Understanding Psychology - Chapter 14

HUMAN ECOLOGY

SUICIDE

Instructional Objectives:

The student will:

1. become aware of the extent of the problem of suicide in our society - particularly among adolescents.
2. become aware of historical and cultural attitudes toward suicide.
3. recognize that suicide is the result of sociological and psychological causes.
4. discuss specific problems and pressures that often contribute to suicidal feelings.
5. correct commonly held misconceptions about suicide.
6. name ways to help a suicidal person.

Materials:

Filmstrip: Suicide Causes and Prevention - 2 parts

HUMAN ECOLOGY

HOW TO SURVIVE BEING ALIVE - STRESS

"What Makes You Crack?"

3 Days

Instructional Objectives:

The student should be able to:

1. identify 6 psychological and physiological characteristics of stress.
2. identify 4 situations which are stressful for them.
3. identify 8 coping skills that will enable one to mediate stress.

Materials:

1. 6 stress reading assignments.
2. Stress flow chart.
3. Stress coping scale
4. lecture noted, "Bright's Method" and "12 Point Plan."

Activities:

STRESS

What Makes You Crack?

By David Schmidt
A.I. duPont H.S.

To Robert Young, stress means a caffeinated cup of coffee. To Eleanor May, it's a nagging, tension headache on a hidden camera. To teenagers, however, stress can be a daily struggle of personal decisions and emotional change. Like the television commercials, stress becomes a problem when it lasts too long or is repeated too often.

Stress is a term coined in its medical usage by Austrian-born Hans Selye, a professor at the University of Montreal. After years of study during the 1940's, he analyzed the bodily reactions to severe injury, disease, poison, and hard work. Seyle noted that each event produced similar, "non-specific" reactions. He called these reactions "stress."

"Stress is a word we don't use much around here," said Joe Avallone, a psychiatric social worker and the admissions director of the Governor Bacon Health Center in Delaware City. "They'll find something like 'a high level of anxiety,' 'depression', or 'low self-image'." You may know stress as having butterflies or being uptight and bent out of shape.

"Stress is meaningless unless you consider how a person perceives a particular experience," explained Avallone. "There's no experience that makes a person psychotic, neurotic, or nervous. It's one's perception of the experience that makes a difference." *(Continued on page 6)*

(Continued from front cover)

For example, two girls are raped. One girl might be upset for a month or so, while the other could be emotionally scarred for the rest of her life.

"Most teenagers perceive more situations as stressful than other groups," Avallone stated. According to him, adolescents see things more dramatically and personally than adults. The label on your jeans and the stripes on your sneakers matter less as time passes.

Situations that produce anxiety are called "stressors". A stressor can be a test, a deadline, or even a promotion. Pleasant or unpleasant, the body responds. These responses include adrenaline secretion, rising blood pressure and temperature, an increase in the heart and breathing rates, and an increase in muscular strength.

Although they seem quite serious, these reactions are necessary for survival if kept under control. Stress sometimes results in a sharpening of the senses or a burst of energy. The right amount of stress will help the body function at peak performance.

Too little or too much stress, however, can be very harmful. Excessive stress may result in mental illness, and no stress at all can result in death. Excessive stress, or distress, is a problem among many Delaware teenagers.

"The teenage population in Delaware is about 75,000 and our agency gets referrals for about 1,000 children a year," said Susan Greenstein, a social worker for the Delaware Division of Social Services in Wilmington. "That is a lot of children with a lot of problems with stress."

The number of teenagers with stress problems isn't increasing, but the severity of these problems is. Greenstein believes changes in society are responsible, but she also blames teen unemployment, higher expectations from parents, and a low drinking age.

Divorce also plays a major role in adolescent stress. Most of the teenagers referred to the Division of Social Services live with a single parent. Other family problems, like unemployment, can also contribute to a child's stress.

Illustration by Kevin Ellis

Greenstein's agency focuses on family counseling because it believes talking with parents is the key to helping the child. Getting them to realize they aren't alone is important, and some parents just need to be convinced their child's behavior is normal, Greenstein said.

Recognizing harmful stress is essential for good health. Insomnia, continuous depression, or the dependence on drugs and alcohol for a lift are common warning signs. If you feel out of touch with what your friends are doing, or if you are excluded or ridiculed by classmates, Greenstein recommends you talk over your problems. There are many people willing to listen. Start with a close friend or your family. If the stress remains overwhelming, seek professional help; however, we all know how expensive psychiatrists can be. Most charge around $50 for a one-hour consultation.

"Money should never be a factor in getting counseling," Avallone advised. Many counseling services offer professional advice at no cost. Avallone recom-

mended seeking help from guidance counselors, your church, mental health clinics, and private agencies.

Greenstein thinks the 24-hour hotlines are a better alternative. "It's really hard to ask for help, and that's where the 24-hour numbers are so helpful," she said. "You don't have to give a name, you can just talk to somebody."

Both CONTACT and the Drug Information Action Line (DIAL) offer free counseling that's only a phone call away. The DIAL staff is manned by prevention and education counselors.

Barbara Morgan, counselor for DIAL, talks with people who call the hotline to find out what kind of help they are willing to accept. Sometimes she refers them to a professional counselor.

Morgan thinks peer pressure, a stress producer, is a major cause of drug abuse. "It's interesting," she said. "If you talk to an adult, I would say, 'Sure, peer pressure has a lot to do with it.' I've seen it happen. But the perception of most young people is that they make up their own minds."

Dealing with stress is as important as dealing at poker. Although the cards may seem stacked against you, don't play with half a deck. Understand the problem before you try to handle it.

Many teenagers use what are called adjustment techniques in coping with stress. These offer temporary relief from frustrating situations. Most people use them without realizing it.

Say you're fired from your job because you were always late. Your first reaction might be an excuse. The boss doesn't accept it, so you think he has it in for you. After shouting, "You can't fire me! I quit!", you leave the office and sulk at home. Soon, however, all is forgotten, and you look for a new job. Without knowing it, you've just used the adjustment techniques of rationalization (excuse), projection (blame), withdrawal (quitting), regression (sulking), and compensation (setting a new goal).

Temporary escape from stress is also offered by drugs and alcohol. Abuse them, and the escape may be permanent. As Hans Selye said, "The only complete freedom from stress is death."

Teenage pressure cooker

"You are going to have to learn to be more responsible." "Why don't you find a job?" "Everything you do reflects on us." "Your car insurance is going to be expensive unless you bring those grades up." "Do you have to go out tonight?"

Do any of these comments sound familiar?

If they do, you're probably experiencing some form of teenage stress. Stress is caused most often by pressure and young people seem, at times, to take more heat than adults.

"A lot of pressure comes from your parents," explains 17-year-old Linda. "You want to please them with school work, your friends, the way you act, and just everything in general."

There are many causes of pressure for teenagers, according to some students questioned on the subject. Brothers and sisters are a famous example. "You get away with everything." "You always get your way." Talk about overused cliches. How many times can you recall saying or hearing that?

"My oldest sister hassles me 'cause my parents are easier on me than they were on her," complains Susan, another 17-year-old. "She is always trying to get me in trouble."

"My teachers and my boss get on my nerves," says Steven, an 18-year-old McKean student. "They'll start yelling because they've had a hard day. They act like they are the only ones with problems."

And what about peer pressure? That's an often-used phrase.

"Why do I always hear about peer pressure," Susan asks? "I mean, if your 'friends' start pushing you, find new friends."

Patty, 16, disagrees with Susan. She knows the feelings of peer pressure. "I'm worried what other people think," she said. "They probably don't even notice all the things I think are wrong with me, so in other words, I think my greatest pressure comes from myself."

"I know a girl," says Linda, "who gets 'sick' quite often in school. You can always find her in the nurse's office. She's bright, yet she always wants to go home. I can remember faking sick in elementary school because I was willing to do anything to get out of math class. But isn't high school kind of old for pulling that trick?"

Pressure on young people comes in different forms, from many different sources. School, friends, parents, teachers—all are pressure producers which can cause stress in teenagers.

If you let it get to you, that's when the problems start.

By Jessica Jarrell, McKean H.S.

For Barry, stress changed his personality

By Jessica Thomas
Dickinson H.S.

(The following is a fictitious case history of a teenager undergoing stress, as presented by Psychologist Edward Heyden of the Newark Family Counseling Center. Any name or characteristics resembling actual people are purely coincidental.)

Barry is a 17-year-old senior at a Delaware high school. He's an intelligent student and an outstanding athlete. Lately, though, he's been missing a lot of basketball practices and school. His home life is also suffering. He's been getting upset over little things and keeps getting into arguments.

Barry's mother is overweight and recently she gained more. She appears very involved in Barry's life and is sometimes overprotective. Barry's father, however, is much the opposite. He's a tall, muscular man who believes in just punishment. Barry's younger sister, Melissa, is a quiet, lonely girl who lives up to the term of perfection.

In this family, Barry feels like the outcast. He rebels against them because he feels different. Barry's homeroom teacher became suspicious of his unusual behavior and talked him into seeing a counselor at the Newark Family Counseling Center.

Barry and his family attended the first session with the counselor, and in that relaxed atmosphere, talked about their problems. After several sessions, the therapist concluded that Barry's mother was rejecting his father by using her gain in weight to separate the two. Melissa, often in a neutral corner, played up to whoever had the power. Barry's mother was also overprotecting him from his father's discipline.

The therapist helped the family reconstruct its patterns of interaction and learn a new way of communication. With help from one another, Barry and his family solved their problems.

According to Psychologist Edward Heyden, the average teenager can usually handle stress. Changing from a teenage identity to adulthood, the responsibilities that go with that change, and the need for both dependence and independent are all experiences potentially leading to stress in young people. At times, these occurrences may just be a part of growing up.

But if a teen can't cope, Heyden says he/she should seek help. Unchecked and constant stress can lead to such physical ailments as nightmares, double vision, hives, hyperventilation, depression, changes in eating habits and a variety of other problems.

Are you experiencing stress? Are you dealing with it properly? Those are questions most teens should ask themselves. If you aren't coping, help is available. Stress, as you see, can be more than just feeling uptight.

What makes you uptight?

Been uptight lately? When The EYE asked it's readers what makes them uptight last month, we received a variety of answers. The most popular answer was, "When I have to worry about a big test."

Being uptight is something everyone encounters in life. Teens probably get more uptight than any other age group—or, so we think. Sherri Brummer of Dover High School wrote in that nagging parents and teachers make her uptight, while a Caesar Rodney student said he gets uptight from his responsibilities. Obnoxious people get Dankie F. of Caesar Rodney upset.

Paula Kelly of Dover High School wrote she feels pressure when she fails a test. Vicky Guessford says money causes her to be upright, and Sherelle Smith gets upset by arguments. One anonymous student wrote in that he gets upright when he can't read his EYE in class.

From the response we got from readers, it looks as if there are many upright teenagers out there. Teenage stress strikes again.

Compiled by John Wesley
Delcastle H.S.

Is Stress really worth it?

By Kristin Merriman
Brandywine H.S.

"Do you have your homework done? I don't want to see a single 'C' on your report card!"

"Why don't you look for a job?"

As teenagers, we are constantly pressured by parents, teachers, friends and employers to achieve great things. Parents want good grades; teachers want 25 page papers handed in in two days. Friends want all your free time devoted to them while employers urge a working schedule of five days a week. Just how much pressure can the average teen handle?

Probably the most pressure comes from either parents or friends. Parental pressure varies depending on what goals they expect you to achieve. Some parents holler that they KNOW you are an above average person, so a 'C' grade is unacceptable. Or maybe they compare you to your "wonderful older brother" who never did anything wrong.

Friends, especially ones the same age, have basically the same insecurities all teenagers face. Important decisions have to be made, and a person's morals set. Friends may be urging you to "just smoke a little" pot, or want you to have a beer chugging contest when you really don't like to drink. Boyfriends or girlfriends may start pressuring you about sex. All these pressures have to be handled through that crucial three-year period called high school.

What teenagers and parents don't often look at is whether the pressure is worth it. Excessive pressure can lead to low self esteem and insecurities. It may cause the pressured teen to be rebellious just to "show everybody I can take care of myself."

Stress on the mind causes stress on the body, and can make one have migraine headaches, stomach cramps or cause fatigue. Insomnia can result and the teenager could start looking for ways to escape the world of worries. Drugs and alcohol are common escape routes, but they only produce more tension, besides messing up the body and brain.

Thousands of teenagers each year go to special group sessions with psychologists or doctors who help ease the burdensome decisions, questions and pressures they feel. Many states have centers set up to help distressed teens who consider running away from their anxieties or even suicide because the constant pushing and nagging from people makes their life unbearable.

If you're having trouble, seek help. Some of us are strong enough to deal with our stress in our own way, but some of us are not. It's not a sign of weakness to admit you need help. It proves you're strong enough to recognize your problems and wise enough to look for answers.

Can stress come back?

by Mae McLoughlin
A.I. duPont H.S.

When the causes for stress have gone, you'd think the stress would be gone too. But, that's not always the case. Without warning, stress from a traumatic experience can come back. It's called post-stress syndrome—a re-occurrence of stress long after its cause.

Post-stress syndrome is most common among military veterans. Military veterans on trial for shootings have, in some instances, used the syndrome as their alibi or defense, testifying they thought they were still in the war when they committed the shooting.

Post-stress syndrome is usually triggered by conditions resembling those under which the stress first occurred. Sounds like those heard during a battle have been known to cause post-stress in veterans.

How does this apply to you? Imagine reliving the stress of being in a car accident while you're driving some night, or feeling the depression of breaking up with someone when you would otherwise feel fine. The reoccurring fright or depression is a form of post-stress.

Quick Charge Method For Relaxing

by

Dr. Bright

Step One - Recognize stress symptom (headache, knot in stomach, tightening of chest, sweaty, clamy hands, clenched jaw, flushed face, change in tone of voice)

Stop what you are doing/inhale deeply/exhale slowly
Convince yourself--the problem is no big deal
Feel sorry for yourself - 3 minutes
Stop talking - cough/light cigarette
Start thinking and stop emoting

12 Point Plan For Students To Relieve Stress

1. exercise
2. develop a hobby
3. get plenty of rest/sleep
4. don't feel guilty
5. don't worry
6. learn to say no
7. be good to yourself
8. have something to look forward to
9. do things in your spare time you've dreamt of
10. keep learning
11. set realistic and flexible goals for yourself
12. travel

SOCIAL INSTITUTIONS

HUMAN ECOLOGY

FAMILY AND SOCIAL INSTITUTIONS

Lesson 1 - Introduction to Unit; Family Terms and Family Function

1 DAY

Instructional Objectives:

Students should be able to:

1. develop a clear perception of the concept "family", their own in particular.
2. begin developing an understanding of the functions of a family.

Materials:

1. Family Survey
2. Family Tree Chart
3. "The American Family"

HUMAN ECOLOGY

FAMILY AND SOCIAL INTERACTIONS

Lesson 2 - Family Functions

1 Day

Instructional Objectives:

Students should be able to:

understand the functions of a family and evaluate their own family's performance of an acceptable list of functions.

Materials:

1. "The American Family"
2. Family Function assignment

HUMAN ECOLOGY

FAMILY AND SOCIAL INSTITUTIONS

Lesson 3 - Family Tree and Family Roles

2 Days

Instructional Objectives:

Students should be able to:

1. become more familiar with their own family background and ancestry.
2. develop an appreciation for the wide variety of backgrounds represented by the class.
3. identify traditional sex roles in the American family, note changes in recent decades, and evaluate these changes.

Materials:

1. Family Tree Charts
2. "The American Family"
3. Reading: "U.S. Women at Work" - excerpts from Population Bulletin, May 1981.

Women and Work
Population Bulletin
"U.S. Women at Work"

Work and Family:

There is no question that the recent flow of women into the U.S. labor force has changed the American family as much as it has changed the American labor force. Such basic family determinants as when and whether women marry and their relationship with their husbands, when and whether these couples have children and how many they have, and who raises the children, are all influenced by women's employment.

• • • •

Marriage:

When-and even whether-women marry may depend on their opportunities for paid employment. For some women employment may make marriage financially feasible, with their earnings functioning as a sort of modern dowry. And men might find marriage to a working woman attractive because two people would share the task of supporting the couple and setting up and furnishing a household. On the other hand, the same earnings that make marriage feasible for a woman and make her attractive to a man as a potential partner may decrease the attraction that marriage holds for her. Working women have less need for the financial support that traditionally goes with marriage and they may prefer their independence over the prospect of dependence on a husband with its concomitant obligations or of sharing their earnings with him. At the same time, employed women may meet more eligible men than those who do not work, thus increasing their chances of receiving a marriage offer they can't refuse.

Sociologists Samuel Preston and Alan Richards found that proportions of single women at age 22 to 24 were likely to be higher in local areas where jobs for women were plentiful and their earnings relatively good compared to men. This seems to indicate that women delay marriage when they have numerous prospects for jobs that pay well. If this is so, it appears that while employment may make marriage more feasible it also makes it less desirable-at least for women.

• • •

Household Division of Labor:

A working woman may think twice about marriage because of the added burdens it can entail. These suspicions were confirmed by time-use surveys of the 1060s which showed that employed wives were not trading housework for employment but adding a paid job to their domestic job. Wives who worked outside the home were still left with all the household tasks that housewives usually do. Husbands contributed virtually no time to housework and this was true whether the wife worked outside the home or not.

Analyzing these data, sociologist Joann Vanek found that when work is defined as time spent in paid employment plus time spent in household tasks and child care, full-time housewives worked the fewest hours and employed wives the most, with married men falling in between. In families with young children, working mothers were putting in about 80 hours per week compared with 65 for their husbands.

As might be expected, these working wives in the 1960s spent fewer hours on housework than full-time housewives, but when their job time was added in their weekly workload totaled many more hours

than that of any other group. They found much of this extra time for catching up on household tasks on weekends. For married men and housewives, by contrast, weekends provided time for leisure.

This rather grim picture of the life of the working wife and mother is tempered somewhat by national survey data for the mid-1960s analyzed by Vanek which indicate that most wives-both employed and housewives-do not want more "help" with housework than they already get from their husbands. Apparently, wives have as much trouble relinquishing control over household tasks as their husbands have assuming responsibility for them.

. . .

Fertility:

The fewer children a woman has, the more likely she is to be employed outside the home. This shows up consistently in studies of fertility and women's labor force participation. Among ever-married women aged 35 to 44 in 1978, for example, those currently in the labor force had 2.7 children, on average, compared with 3.2 among women not in the labor force. This lower fertility among employed women is true among women of all ages and all ethnic groups, and for divorced, widowed, and separated women as well as the currently married. Generally employed women have the fewest children and women not in the labor force the most, with the unemployed falling in between. The lower fertility of young working women could be due to timing-perhaps those with jobs delay childbearing in order to establish themselves at work or to accumulate assets before starting a family. But the lower fertility of employed women at ages 35 to 44 suggests that working women are likely to end up with small-

er families since virtually all American women complete their childbearing by the time they reach their mid-thirties.

Exactly why low fertility and high labor force participation are linked has puzzled researchers for some time. Sociologists and demographers have argued that women may reduce their family size to give them time to work or that women who, for whatever reason, have few children therefore have time to work. Economic theorists--including such notables as Jacob Mincer and Richard Easterlin-have argued that it is not that fertility and wives' work affect each other, but that both respond to changes in such economic factors as the husband's income.

Clearly, whether woman work depends in part on their recent childbearing; having young children greatly reduces the chances that a woman will be in the labor force, although young children seem to be inhibiting their mothers' employment less now than in the past.

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Child Care:

With the rapid increase in mothers' employment, many are asking: Who cares for the children while their mothers work? This question can be answered fairly well for children over three but not for the youngest children. According to the Census Bureau, 54 percent of three-to-sex-year-old children of working mothers were cared for during the day by a parent in 1975, 20 percent were cared for by another relative; 22 percent by someone unrelated to them, either in their own home or that person's home; and only 4 percent went to a day-care center. Nine out of ten children between 7 and 13 were cared for by

a relative before or after school or fended for themselves. In 1980, there were an estimated 2 million "latchkey" children this age-children who come home to empty houses.

In 1980 also, as noted, with the mothers of 7 million children under age six out working, there were only 1.6 million slots in licensed day-care centers-60 percent of which are commercially run. Some of these slots are taken up by children of nonworking mothers, of course, and in any case, few day-care centers accept very young children. Working mothers of three-to-five year olds-like nonworking mothers-are increasingly relying on nursery schools to provide child care for at least part of the day. By 1976, nursery school and kindergarten enrollment of children of working mothers ranged from 26 percent for three-year-olds to 82 percent for five-year-olds.

Most working mothers of children under three must evidently rely on babysitters and relatives. Some have someone come into their home while they work; others take their child to someone else's home for care. But as more middle-aged women work, the pool of potential childcare givers shrinks. One cannot ask grandmother to care for the baby if grandmother already has a job.

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Divorce and Remarriage:

A wife's earnings may enhance marital stability because they increase a family's income but they may also give her the financial independence to get out of a bad marriage. Several studies have found that when women earn high incomes the chances increase that they will eventually divorce.

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Family Economic Well-Being:

One of the most visible contributions that working wives make to their families is additional income. In a recent publication, tha Department of Labor points out that the wife's earnings frequently raise a family out of poverty. In 1979 among all husband-wife families, labor force participation by the wife towered the proportion of these families who were poor from 14.8 percent to 3.8 percent. Wives who worked at all contributed one-fourth of total family income and those who worked full time, all year, earned one-third of the total family income.

These figures overstate the case, unfortunately. For one thing, taxes reduce the benefits that two-earner families receive from the wife's job.

The family of a woman who decides to take a job outside the home incurs costs as a result of her employment and these must be deducted from her earnings before calculating the gains from her job. These costs might include transportation to work, the clothing or special equipment she needs, meals out at work, and any other purchases she would not make if she did not work.

As a result, the one-earner family with an income of $25,000 a year and the services of a full-time homemaker probably enjoys a higher standard of living than the two-earner family with the same income, because the one-earner family has an additional 40 hours per week of the housewife's time and the goods and services she produces with them.

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Marital Relations:

For years, students of the family have been concerned about the effect of wives' employment on their families and especially on husband-wife relations. Some have argued that wives' labor force activity increases stress, impairs the husband's health, and reduces marital satisfaction, communication, and companionship. The late Harvard sociologist Talcott Parsons identified the traditional family-male breadwinner and female household manager-as the most "functional" family form for post World War II America. But family sociologists have also noted the disadvantages of this family type, including wives' isolation, frustration over their husbands' work commitment, and their own lack of control over their economic and social situation. Research support exists for both positions.

A study reported in 1976 concluded that husbands of working women were in poorer health and less satisfied with their marriages than husbands of full-time housewives, although working women appeared healthier and more satisfied than housewives. These researchers suggested that, while employment contributes to the wife's sense of personal growth and fulfillment, it creates stress and illness for the husband because of the reduced personal attention and care he receives, the threat to his central position in the family, his increased child-care and home duties, and the demands on him to support his wife's work role. A replication of this study, however, concluded that the problem was not the fact of a wife's working but changes in her work status. Both partners in couples in which the wife had recently entered or left the labor force showed more symptoms of stress and marital discord than couples in which the wife was either stably employed or a full-time housewife.

Working wives themselves are happier and more satisfied than full-time housewives, according to several studies, because their jobs provide a source of self-esteem, independence, status, and social contacts unavailable to the housewife. The typical working wife's double role as worker and housewife might be expected to cause stress and overwork which full-time housewives escape. But sociologist James Wright searched a number of national surveys for differences between employed wives and housewives in indicators of happiness and reported satisfaction with life and found no consistent differences. He concluded that both work and housekeeping roles have costs and benefits for women-and for their families.

HUMAN ECOLOGY

FAMILY AND SOCIAL INSTITUTIONS

Lesson 4 - Family Relationships

1 Day

Instructional Objectives:

The students should be able to analyze their relationships with other members of their family and determine what could be done to improve their relations if necessary.

Materials:

1. Family Survey
2. Family Survey compilation results.
3. Filmstrip: "Today's Family: A Changing Concept"
4. "The American Family"

HUMAN ECOLOGY

FAMILY AND SOCIAL INSTITUTIONS

Lesson 5 - Marriage

1 Day

Instructional Objectives:

Students should be able to:

1. identify the factors that limit his/her choice in selecting a marriage partner.
2. identify the law in the state of Delaware pertaining to marriage.

Materials:

1. "The American Family"
2. Ditto in Delaware Laws pertaining to marriage, annulment, and divorce.

HUMAN ECOLOGY: DELAWARE LAWS: MARRIAGE, ANNULMENT, DIVORCE

You cannot marry your "ancestor, descendant, brother, sister, uncle, aunt, niece, nephew, or first cousin."

A marriage can be annulled if either party is:

1. of unsound mind
2. a present or former insane asylum patient, unless supt. of asylum agrees to his/her fitness to marry
3. suffering from V.D. or other communicable disease unknown to other party
4. an habitual drunkard
5. a confirmed user of a narcotic drug
6. divorced, unless he/she produces a divorce decree from latest marriage
7. on probation or parole, unless court grants approval
8. if both parties are paupers
9. incurable, physically impotent if unknown to other party at time of marriage
10. committing bigamy
11. committing fraud, or using force or coercion

Marriage Requirements:

1. Marriage license - either party a resident - 24 hours
   usable 30 days neither party a resident - 96 hours
2. Minimum age - 18
   Females may marry at 16 with parent permission
   Couples may marry underage if parents or prospective parents
3. Pre-marital physical exam and serological test - within 30 days of license
4. Common law marriages are illegal
5. Marriage contracts affecting the rights of each concerning the estate of the other are legal and optional.

Divorce:

Either party must have been a Delaware resident at least 1 year.
Grounds:

1. adultery
2. bigamy
3. imprisonment for at least 2 years [or at least 1 year on an indeterminate sentence]
4. extreme cruelty
5. desertion - 1 year
6. habitual drunkenness - 2 years
7. inability to support a family
8. mentally retarded, epileptic, or chronically or recurrently mentally ill - 5 years
9. separation without cohabitation - 18 months
10. incompatibility - 2 years

HUMAN ECOLOGY

FAMILY AND SOCIAL INSTITUTIONS

Lesson 6 - Divorce

1 Day

Instructional Objectives:

Students should be able to:

1. identify the factors that contribute to unsuccessful marriages.
2. cite grounds for annulment and divorce in the state of Delaware.
3. recognize the problems that children of divorced parents can suffer.

Materials:

1. "The American Family"
2. Sound/Slide program, "Family Crisis: When Parents Divorce"
3. Ditto sheet on Delaware laws pertaining to marriage, annulment, and divorce. [p. V14]

HUMAN ECOLOGY

FAMILY AND SOCIAL INSTITUTIONS

Lesson 7 - Parent - Child Relationships and Divorce

1 Day

Instructional Objectives:

Students should be able to:

1. identify those factors that contribute to healthy, desirable relations between themselves and their parent.
2. identify the effects that a divorce can have on parent - child relationships.
3. describe how a child of divorced parents can learn to cope with this new situation.

HUMAN ECOLOGY

FAMILY AND SOCIAL INSTITUTIONS

Lesson 8 - Religion Survey and Social Institutions

2 Days

Instructional Objectives:

Students should be able to:

1. determine and analyze the extent to which religion plays a role in their lives.
2. identify appropriate social institutions that people with special problems could turn to.

Materials:

1. Religion Survey
2. Sound/Slide program: "How to Live with Your Parents and Survive".
3. "Partial list of Social Service Agencies and Institutions ditto [p. V18-24]
4. Assignment sheet accompanying #3 [p. V19]

PARTIAL LIST OF SOCIAL SERVICE AGENCIES AND INSTITUTIONS IN NEW CASTLE COUNTY

Name, Address, Telephone No.	Description of Services	How Funded
Adult Day Care Center 810 S. Broom St. Wilmington, DE 19805 571 1803	Nursing services, arts, crafts, recreation, meals, counseling, occupational and reality orientation therapy, physical and speech therapy	Fed. funds and user fees
Alcoholics Anonymous 18-B Trolley Square Wilmington, DE 19806 655 5133	Offers speakers on alcoholism and meetings and counseling for those afflicted with alcoholism	* plus city funds
Alcoholism and Drug Abuse 1901 N. duPont Hwy. New Castle, DE 19720 421 6101	Offers in-patient, out-patient, and detoxification services for abusers of drugs and alcohol. Also provides information, education, and prevention programs	State funds
American Civil Liberties Union 1608A Farmers Bank Bldg Wilmington, DE 19801 654 3966	Represents individuals and/or groups in legal matters involving alleged violations of Constitutional rights	some fees
American Red Cross 910 Gilpin Ave. Wilmington, DE 19899 655 3341	Aid to military personnel/veterans, disaster relief, first aid instruction, life guard instruction, blood services	*98% plus other misc. grants & gifts
Anti-Discrimination Sect., Dept. of Labor Delaware State Bldg. Wilmington, DE 19801 571 2900	End discriminating practices in employment by hearing complaints, investigating, holding conciliation mtgs. and generally resolving the problem	Fed/state funds
Better Business Bureau, Inc. 1901 W. 11th St. Wilmington, DE 19805 652 3833	Authenticates local businesses, handles consumer complaints, provides consumer information, promotes ethical and fair business practices	membership dues and subcriptions
Big Brothers, Big Sisters 701 Shipley St. Wilmington, DE 19801 654 5301	Provides volunteer adult men and women to serve as an older friend to a single parent child - meeting with that person at least weekly	Fed., state and local grants *
Catholic Social Services 1200 N. Broom St. Wilmington, DE 19806 655 9624	Counseling - pre-marital, marital, family, pregnancy - food, rent, utilities crisis assistance, adoption services, foster care, homebound care	*33% plus fees, contracts, church
Children's Bureau of Delaware 2005 Baynard Blvd. Wilmington, DE 19802 658 5177	Foster family care for children, adoption services. A Resource Center For Youth (sex counseling, VD tests, pregnancy tests), outreach prog. La Oficina de los Ninos.	* plus contributions, state serv. contracts

* United Way funds

Children's Home, Inc. 2901 Green St. Claymont, DE 19703 798 0601	Provides complete care for children (age 9 - 17) who cannot be cared for in their own homes. Also offers parent-child counseling.	Fees
Child Support Enforcement 920 Church St. Wilmington, DE 19801 571 2336	Helps locate and collect support payments for their children from absent parents. A national network.	State and fed. funds Fees from those not on welfare
Community Action of Greater Wilm. 1103 N. Madison St. Wilmington, DE 19801 571 0538	Operates Poverty Resource Action Ctr. which provides info and referral services, food, nutrition services, housing and preservation services, Energy Crisis Program. Head Start.	Federal State City funds
Community Legal Aid Society 913 Washington St. Wilmington, DE 19801 575 0660	Provides legal services and advice to low income residents	*
Community Services, AFL-CIO 573 2443 or 573 2440	Crisis help, alcoholism and drug abuse programs, pre-retirement counseling, career development, home repair aid, restitution prog. for young offenders	* plus city funds
Consumer Affairs, Div. of Delaware State Bldg. Wilmington, DE 19801 571 3250	Investigates consumer complaints pertaining to fraudulent business practices, door-to-door sales, landlord-tenant disputes, deceptive advertising, etc.	State
Contact Washington and Lea Blvd Wilmington, DE 19802 575 1112	Listening, counseling, and referral service for people with a wide variety of personal and family problems. Done entirely over the telephone.	* 11% plus contributions foundations churches
Crittenton Rehabilitation Ctr. 504 S. Clayton St. Wilmington, DE 19805 571 3505	Operates an in-patient facility for adults who are drug abusers.	* plus fees
Delaware Adolescent Program 14th and Market Sts. Wilmington, DE 19801 652 3445	Offers educational, medical, social and day care services to teen age mothers.	Fed. and State funds plus Wilm. Pub. Schs.
Delaware Alcoholism Council 701 Shipley St. Wilmington, DE 19801 656 8274	Provides literature and organizes educational programs in schools and communities. Direct counseling of families with alcoholic problems	Membership dues and contributions
Delaware Council on Gambling Problems 900 Washington St. Wilmington, DE 19801 655 3261	Sponsors lectures, workshops, and individual or group counseling to those with gambling problems	State

Delaware Curative Workshop 1600 Washington St. Wilmington, DE 19802 655 2521	Outpatient clinic providing physical, psychological, social and vocational therapy for rehabilitating patients	* plus user fees
Delaware Opportunities Industrialization Center, Inc. 813 West St. Wilmington, DE 19801 654 6205	Provides training for unemployed or underemployed persons and job counseling and follow-up counseling.	
Dial-Drug Information Action Line 501 W. 11th St. Wilmington, DE 19801 738 5555	Offers telephone counseling for drug users as well as referral services to other agencies. Some face-to-face counseling.	*
Employment Services for Senior Citizens 1901 Market St. Wilmington, DE 19802 658 8033	Provides job development, referral, and placement counseling for the elderly.	*
Family Service of Northern Delaware 809 Washington St. Wilmington, DE 19801 AND Suite 108, Webster Bldg, Concord Plaza, 3411 Silverside Rd. Wilmington, DE 19803 478 8050	Family counseling (marital problems, adolescent, old age problems, etc.) aid to stranded families, runaways, migrants, courses and workshops, home care programs for help during illness or accident.	* plus state contracts, adjustable user fees, contributions
Family Violence Program of Child, Inc. Box 4055 Greenville, DE 19807 652 3547 or 652 8441	Children's rights, protection, emergency shelter, parent training, help for the "Beaten, Battered, or Physically Abused."	Fed. and state funds
Foster Grandparents Program Delaware State Building Wilmington, DE 19801 571 3491	Makes use of elderly to serve as foster grandparents to children with special, usually emotional, needs. Makes elderly feel useful also.	Fed. and state grants
Geriatric Services of Northern Delaware 1304 N. Rodney St. Wilmington, DE 19806 658 6731	Provides nursing and homemaking services to elderly at home, provides foster home care for ambulatory elders, and Meals on Wheels	* plus fees based on patient's ability to pay
Goodwill Industries 17th and Spruce Sts. Wilmington, DE 19802 652 3275	Vacational testing, work adjustment training, job seeking skills, job development/placement, sheltered employment - all for the handicapped	* plus store & cafeteria income, grants, donations
Governor's Commission - Status of Women Delaware State Bld/g Wilmington, DE 19801 571 2660	To improve the status of women at home, in their jobs, politically, etc. thrugh supporting legislation, holding workshops, publishing newsletters, etc.	State funds

Handicapped Children, New Castle County School District, Area I Pennsylvania Ave. Claymont, DE 19703 792-2744	Health testing, psychological services, individual and group therapy, social casework	NCCSD
HUD/FHA 1500 Pennsylvania Ave. Wilmington, DE 19806 573 6300	Services related to home purchases, improvements, mortgages, insurance, low-income housing, community planning and development.	Federal
Human Relations Office Delaware State Bldg. Wilmington, DE 19801 571 3485	Information and referral service to those with questions concerning fair housing law compliance and employment discrimination laws.	State
Jewish Family Service 101 Garden of Eden Rd. Wilmington, DE 19803 478 9411	Offers individual and family counseling and services to the elderly, Provides socialization for physically and mentally handicapped	*plus fees based on ability to pay
Latin America Community Center 7th and Harrison Sts. Wilmington, DE 19805 655 7338	Provides neighborhood services, job referral and counseling, housing information, transportation, interpreter services, day care services.	*plus fees based on income
Limen House For Men, Inc. 903 Madison St. Wilmington, DE 19801 652 7969	Half-way house for alcoholics, offering tutoring, recreation, and counseling.	*plus fees
Limen House For Women, Inc. 623 N. Broom St. Wilmington, DE 19805 571 1216	Half-way house for alcoholics, offering medical treatment, education, and counseling.	*plus fees
Manpower Development, Div. of City/County Bldg. Wilmington, DE 19801 571 4285	Recruits unemployed for public service jobs, provides job counseling, Women can receive some training in non-traditional jobs.	Wilmington
Mary, Mother of Hope House for Women 1103 W. 8th St. Wilmington, DE 19806 656 8177	Provides shelter for homeless, abandoned destitute women. Also social and job counseling.	Contributions and donations
Mental Health Assoc. in Delaware 1813 N. Franklin St. Wilmington, DE 19802 656 8308	Emphasises education, information, and referral services in order to promote mental health, prevent mental illness, and improve treatment of mentally ill.	*50% plus foundations, trusts, and memberships
Mental Health, Div. of 1901 N. duPont Highway New Castle, DE 19720 421 6101	Offers programs and counseling and administers mental hygiene clinics throughout the state	State and fees

Methodist Action Program 900 Washington St. Wilmington, DE 19801 6543101	Aids families w/dependent children, rehabilitates prisoners, supports Problem Gambling Ctr., anti-racism act., week & day camps, supports Emergency Food & Clothing Cupboards	Church supported plus donations
National Assoc. for the Advancement of Colored People Walnut St. YMCA Wilmington, DE 19801 655 0998	Civil rights organization offering counseling in housing, jobs, consumer rights, provides travelors aid, aid in transportation, career counseling, and recreation.	Donations
Open Door 1813 B Marsh Rd. Wilmington, DE 19803 475 4475	Offers short term drug and alcohol abuse counseling, and educational programs for schools.	
Opportunity Center 3030 Bowers St. Wilmington, DE 19802 762 0300	Provides job training and employment for the handicapped.	* plus income from sale of products & serv.
People's Settlement 408 E. 8th St. Wilmington, DE 19801 658 4133	Provides community services, political education, voter registration, Credit Union, medical clinic, tutoring, and recreation.	Fees
Planned Parenthood 825 Washington St. Wilmington, DE 19801 655 7293	Offers family planning counseling, birth control information, contraceptives, pregnancy tests, venereal disease testing.	Fees
Public Defender Public Building Wilmington, DE 19801 571 3230	Provides legal counsel for those charged with committing crimes who are financially unable to provide their own.	State
Public Health Services City/County Health Building 1310 Delaware Ave. Wilmington, DE 19801 571 3410	Health testing, nutrition counseling, dental care, eye & ear exams, glaucoma testing, speech therapy, lung disease services, lead poisoning tests, immunizations, environmental inspections, birth control services, pap tests, etc.	Federal plus some fees
Retired Senior Volunteer Prog. 606 New Rd. Ctr. Wilmington, DE 19805 995 6118	Provides opportunity for senior citizens to volunteer their time and talent in a variety of community and social services.	Federal and State
Rural Housing Services Odessa New Castle Co. Bldg. Odessa, DE 19730 378 8372	Provides housing information and technical assistance to lov to moderate families. Aids these families to identify and apply for gov't housing assistance prog.	County

Salvation Army 401 Shipley St. Wilmington, DE 19899 656 1667	Offers family and emergency services, educational day care services, counseling on variety of problems, emergency housing shelter, rehabilitation ctr.	* plus income Thrift Store, fees on income
Senior Citizens Affordable Taxi 1227 E. 15th St. Wilmington, DE 19802 654 4100	Provides reduced taxi fares for senior citizens during specified hours.	Sale of discounted tickets used for fares
Social Services, Div. of 28th and Gov. Printz Blvd. Wilmington, DE 19899 571 3101	Aid to families with dependent children, general assistance, Food Stamps, child and adult protective services, foster care, adoption services, family planning, day care, family counseling.	State, plus fees
South Wilmington Community Council 1233 Apple St. Wilmington, DE 19801 655 6543	Community services, crisis intervention, and recreation programs offered.	*
Speech and Hearing Services 3000 Newport Gap Pike Wilmington, DE 19808 994 2506	Sponsors diagnosis, therapy, and clinical services to people with speech and hearing problems.	State
St. Anthony's Community Center 1714 W. 9th St. Wilmington, DE 19805 652 2352	Day care services, aid to senior citizens, youth recreation, counseling in housing problems (repairs, mortgages, ownership, renting), emergency shelter.	*plus user fees, donations
Starck School for the Hearing Impaired Chestnut Hill Rd. Newark, DE 19711 454 2000	NCCSD school for the hearing impaired, grades 1 through 12, serves entire state.	State
United Cerebral Palsy 701 Shipley St. Wilmington, DE 19801 656 8131	Summer day camps, adult programs, home visits, coordinates funding for equipment and home modification. Plays advocacy role w/other state agencies.	*plus donations
Veterans Services 1601 Kirkwood Hwy. Elsmere, DE 19805 998 0191	Administer veterans' benefits (education, loans, disability, medical care, insurance, mortgages, etc.)	Federal
Victim's Services Program 820 N. French St., 8th Floor Wilmington, DE 19801 571 3053	Provide legal and support assistance to victims of crime.	State
Violent Crimes Compensation 800 Delaware Ave., Suite 500 Wilmington, DE 19801 571 3030	Provides some compensation to victims or the dependents of victims who suffered personal injuries for medical treatment, loss of earnings, out-of-pocket expenses, disfigurement, etc.	10% surcharge on all court imposed fines, penalties, and forfeitures

Visiting Nurse Association 2713 Lancaster Ave. Wilmington, DE 19805 658 5205	Home health care, nursing, occupational and speech therapy, social and nutritional services, homemaker services.	*plus adjustable user fees, donations
West End Neighborhood House 710 N. Lincoln St. Wilmington, DE 19805 658 4171	Offers day care services, education classes (adult, Head Start, tutoring), employment counseling, variety of health services, social group services.	*40% plus Gov't agency grants and fees
WHEELS 3300 Faulkland Rd. Wilmington, DE 19808 571 7735	Provides health care transportation to elderly who have no means of getting to a doctor, clinic, or other health care facilities.	County and State
Wilmington Senior Center 1901 Market St. Wilmington, DE 19802 658 8033	Provides hot meals, counseling, medical referrals, housing information, job openings information, crisis intervention, consumer complaint investigation.	* plus fees
Work Incentive Program 801 West St. Wilmington, DE 571 2816	Provides manpower services, training and placement.	
YMCA 11th and Washington Sts. Wilmington, DE 19801 571 6900	Health/Phys Ed. programs, community guidance and counseling, classes in recreation, cultural arts, human relations, residence & cafeteria services.	*plus fees, dues, and gov't grants
YWCA 908 King St. Wilmington, DE 19801 658 7161	Health and phys. ed. classes, crafts, housing, day care, and post-mastectomy exercise programs	*plus fees and dues.

HUMAN ECOLOGY

FAMILY AND SOCIAL INSTITUTIONS

Lessons 9, 10, 11, 12, 13, 14 - Social Agencies and Institutions

Instructional Objectives:

Students should be able to:

1. answer the following questions pertaining to several agencies and institutions

   a. What kinds of services does the agency offer?
   b. To whom are these services offered?
   c. What fee, if any, is charged for these services?

2. evaluate speakers on their ability to be informative, interesting and hold the attention of the class

Materials:

1. Determined by respective speakers
2. Evaluation form [pg. W20]

Activities:

1. Invite outside speakers representing a variety of social agencies and institutions to talk about the work of their respective agencies and respond to student questions.

2. At the end of the unit, during the review session, students will be asked to fill out an evaluation form pertaining to the outside speakers.

ENVIRONMENTAL FACTORS

HUMAN ECOLOGY

ENVIRONMENTAL FACTORS

Lesson 1 - Environmental Pollution

3 Days

Instructional Objectives:

Upon completion of this lesson, the student should be able to:

1. identify environmental pollution problems related to an urban area.
2. present a manageable solution to these problems.
3. present the solution to the class for evaluation.

Activities:

1. You will be given materials describing an imaginary city known as Gotham City. Like other cities, Gotham City has many environmental problems. Many of Gotham City's problems may be similar to those in your area. You will try to solve some of Gotham City's problems.

   Read the information about Gotham City and identify at least five environmental pollution problems of concern to Gotham City. Put the problems in order of most concern to you. In succeeding days, you will research an assigned problem and attempt to solve it. Turn in problem sheet at end of period.

2. Convene the class into the various task forces. Give each task force the opportunity to brainstorm a common problem and to develop a strategy for diagnosing and learning how to influence their problem.

3. The task forces should use this day to research their problem. Remind them to bring to class any information they might have concerning their problem.

4. Reports from the task forces will be presented as the concluding activity for each subunit.

5. One day will be given over to each sub lesson (i.e. Air pollution, water pollution, solid waste disposal, noise pollution, radiation pollution, waste treatment, pesticides, thermal - at the discretion of the teachers)

6. The results of the activities are to be summarized in the form of a chart.

HUMAN ECOLOGY

Environmental Factors

Lesson 2 - Population Explosion

3 Days

Instructional Objectives:

Upon completion of this lesson, the student should be able to:

1. identify the two most important factors in the rate of population increase.
2. list four possible consequences if the human population continues to increase.
3. distinguish between artificial and natural birth control.
4. identify three areas of scientific research which offers hope for the future.
5. identify population trends in the U.S.
6. discuss the affect of population growth in the U.S. on food supply and recreational facilities.

Materials:

Graphing exercise - "Population Growth in the United States."
Reading, "The Human Population."

Activities:

1. Plot data from "Population Growth in the United States" and answer discussion questions.

Environmental Factors

"Population Growth in the United States"

What has happened to the population of man since the days of Malthus? Malthus was able to show that the population of the English colonies in America had doubled every 25 years from 1643 to 1760. The population had grown as a geometric series.

Year	Thousands of People
1630	4
1650	50
1670	111
1690	210
1710	331
1730	629
1750	1,170
1770	2,148
1790	3,929
1810	7,224
1830	12,901
1850	23,261
1870	39,905
1890	63,056
1910	92,407
1930	123,188
1950	151,683
1970	209,000

Listed in the table above are some population figures for the United States from 1630 to 1970. Plot these figures on graph paper to see if the population of the United States has grown as a geometric series.

Discussion

1. Does your graph suggest an arithmetic or geometric population growth in the U.S.?
2. If the population of the U.S. continues growing at the present rate, what total might it reach by the year 2,000? Hint: Project your curve upward for another 30 years.
3. Do you think food has ever been a limiting factor in the population growth in the U.S.?
4. Do you think that food might become a limiting factor to our population growth in the future? Support your answer.
5. Most of you will be 36 to 38 years old by the year 2,000. This is the approximate age of many of your parents. Imagine yourself at this age, and then consider what life in the United States may be like in the year 2000 if our population continues to grow at its present rate.

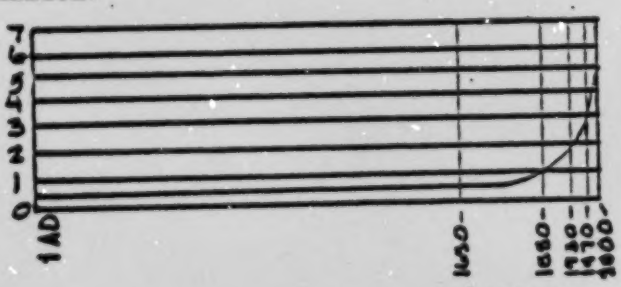
a. Will there be recreational space (parks, forests, clear rivers) for you and your family?
b. Will there be enough food for you and your family?
c. Will our national resources be able to support such a population? (Resources to consider: water, food, minerals, fuel, metals, lumber, clean air.)

6. From your answers to questions 1-5, do you think the time has come to seriously consider limiting population growth in the United States? Explain.

Environmental Factors

"The Human Population"

An important result of cultural evolution is the human population explosion. It is estimated that humans numbered about 0.25 billion in the year 1 A.D. By 1650, world population doubled . It took 200 more years to reach the billion mark. The population doubled again in the period between 1850 and 1930. In 1970, the world's population was about 3.5 billion. Thus, the period of time in which the population doubles continues to decrease. The average rate of world population increase is about 2.2 to 2.5 percent per year. This is an increase of more than 100,000 people per day. At this rate the population will double again in 30 years! By the year 2000, the population would be about 7 billion.



The Population Explosion:

Two factors are important in the rate of increase in population. These are the birthrate (natality rate) and death rate (mortality rate). An increase in the birthrate alone has not caused the human population explosion. What has happened is that the death rate has decreased. It has decreased faster than the birthrate has increased. More people are born than die. The net result is an increase in population.

The decline in the death rate is due primarily to improvements in sanitation and medicine. These factors are part of cultural evolution, not biological evolution.

The human population is made up of organisms. Like all other population, it interacts with its environment. It cannot continue to expand indefinitely. A point is reached in any population at which the environment cannot support additional growth. Will this happen to humans? Most ecologists agree that it will.

What might happen to humans if the population exceeds the carrying capacity of the environment? The future is difficult to predict. Overcrowding can lead to intraspecific competition and aggression in nonhuman populations. In humans, aggression often takes the form of wars. Increased population density also increases disease and famine. Famine and disease have checked human population growth throughout history. However, they are not major factors now. But with a much larger population, they might become important again. Also, peace has not yet been substituted for war.

In order to have enough food, humans might have to kill all competitive consumers. In the absence of other animals, humans would become herbivores. Energy would not be lost through long food chains. Thus, there would be more available to humans. In any event, it seems certain that a continued population explosion will lead to a lower standard of living. Do you think people will be willing to settle for this? Explain.

Most natural checks of population growth are increases in the death rate. The other alternative would be to decrease the birthrate. This can be done via family planning methods. Biologists and physicians have developed several ways of preventing fertilization during

intercourse. These are based on the anatomical and physiological aspects of reproduction. They are known as contraceptive devices.

Contraceptive devices are artificial means of preventing fertilization. An alternative to these devices is natural birth control. Natural birth control is based on the fact that ovulation usually occurs at about the midpoint of the menstrual cycle. The egg can be fertilized only within about 12 hours after its release from the ovary. Therefore, the chances of fertilization can be reduced by not having intercourse near the time of ovulation. However, there is not an accurate way of determining the exact time of ovulation.

Many countries around the world educate their citizens about family planning. Many families realize the effects of a population explosion. Thus, they use some family planning methods. Which, if any, family planning method is used depends upon several factors. These include physical, emotional, religious, and moral factors.

The birthrate in the United States has declined. By the end of 1973, it was 1.9 children per woman of childbearing age. This is less than the 2.2 children needed to keep the population size constant. The birthrate is still greater than the death rate. Thus, to attain zero population growth, this rate would have to be maintained for several generations.

Cause for Optimism:

Pollution of the environment, wasting of resources, and an expanding population are real and important problems facing humans.

These problems are the result of cultural evolution. They are the result of superior intelligence and free will. They were either not foreseen or not believed. It remains for men and women to care about the environment and the environment of their children. They must care enough to face the problems and do everything possible to solve them. If they ingore these problems, all problems connected with the place of humans in nature will be compounded.

While humans are tampering with the natural balance of their environment, they also stand on the brink of great discoveries. Scientists and physicians are finding ways of prolonging life. Organ transplants and artificial organs may become common in the future. This is possible if problems of rejection are overcome. The cure and prevention of cancer, heart disease, and respiratory ailments might someday be possible. Thus, the effects of aging and disease may be avoided to a large extent.

Discoveries in genetics promise a new era in medicine. Geneticists are studying the effects of genes and determining the locations of genes on chromosomes. As a result, they are learning about the causes of hereditary diseases. In the not too distant future it may be possible to destroy harmful genes with laser beams. If the human DNA code is "cracked," it may be possible to make normal genes. Viruses containing these normal genes could be used to introduce them into the body. Perhaps this could be done by transduction. These practices are called genetic engineering. If they become possible, hereditary diseases such as hemophilia, diabetes mellitus, and sickle cell anemia could be wiped out. At present they can be treated, but not prevented.

Amniocentesis is already being used to detect chromosome defects in unborn children. Cells can be isolated from the amniotic fluid. Then karyotypes can be prepared from the cells. In this way, diseases such as Down's syndrome can be identified. At present, very little can be done to correct these defects. However, in the future, maybe they can be treated before the child is born.

Genetic counseling is available to prospective parents from families with a history of hereditary disease. The genetic counselor can advise the parents about the chances of their offspring being born with the disease. As a result of genetic counseling, some couples may choose not to have children. Thus, children with incurable diseases would not be born. Genetic counseling will probably become more common in the future.

Assuming that someday genetic engineering becomes possible, there are several moral questions. Should humans create life artificially? Should they design other human beings according to their whims? Is it wise to increase the size of an already exploding population? Who will be entrusted with making the decisions about the kinds and numbers of humans? Is too much knowledge dangerous to the human species? These are difficult questions.

Humans are the most complex of all organisms. Their biological gifts of reason and intelligence have enabled them to put men on the moon. However, use of these same gifts has resulted in ecological problems. Fortunately, people have come to realize the results of pollution, poor conservation methods, and overpopulation. Scientists and nonscientists alike are becoming aware of and concerned about these problems. A new spirit of cooperation, planning, and thoughtfulness has arisen. Hopefully, humans will continue to use their gifts

of reason and intelligence well. Thus, they might be able to ensure their survival and that of all other living systems.

DISCUSSION

1. Describe the trend in world population growth throughout history and define the population explosion.
2. State the population of your state, the United States and the world.
3. Compare how birth and death roles affect population size.
4. What factors account for the decline in the death rate?
5. How has cultural evolution helped increase the human population size?
6. What natural checks of population growth might affect the human population in the future?
7. What alternatives are there to these natural checks of population growth?
8. Why might humans have to become herbivores?

   How do contraceptive devices prevent increase in population size?
10. What is natural birth control?
11. What categories of factors are involved when making decisions about using family planning methods?
12. What is involved in zero population control?
13. What medical advances in the future might prolong life? How would this affect human population size?
14. What is genetic engineering? How might it be used?
15. What is amniocentesis? How might it be used?
16. How can genetic counseling be helpful?

HUMAN ECOLOGY

ENVIRONMENTAL FACTORS

Lesson 3 - Energy

6 Days

Instructional Objectives:

Upon completion of this lesson, the student should be able to:

1. read an electric meter.
2. list all the electrical appliances in his home.
3. compare energy use in the United States with other nations.
4. indicate the role of which we increase our energy use.
5. explain exponential growth.
6. list five reasons for the increased energy use.
7. list 3 reasons for the United States shifting away from using coal as its major energy supply.
8. explain how the energy growth rate and population explosion are related.
9. construct and interpret a line or bar graph on Total Energy Consumption and on Total Energy Consumed per Capita
10. describe how a nuclear reactor can produce electricity.
11. name four advantages and three disadvantages to developing the nuclear option.
12. locate on a map the nuclear power plants which supply energy to Delaware.
13. explain the state of development nuclear fusion is in.
14. name four energy sources of the future, i.e. wind, geothermal, waste and solar and discuss the advantages and disadvantages of each.

Materials:

1. sheet on "How to Read an Electric Meter."
2. reading: "Our Present Energy Situation - How We Got There".
3. investigation: "The Nuclear Controversy".
4. investigation: "Our Energy Growth Rate and Its Implications"
5. reading: "Energy Sources of the Future".
6. worksheet: "Congressional Hearing: The Energy Crisis".

HUMAN ECOLOGY
ACTIVITY

"HOW TO READ AN ELECTRIC METER"

One week prior to starting the unit, explain to the students that the kilowatt-hour (KWH) is the accepted unit of energy from the electric company. Electric meters are usually located by back doors or in garages and have four or five circular dials that are read from left to right. Adjacent dials go in opposite directions. Where the indicator is between two numbers, the smaller of the numbers is always read. The following is an example meter:

This would be a reading of 2579 KWH. Students are to read the meter daily for the week preceding the unit. Electricity usage for a day is found be subtracting a day's reading from the following day's reading.

Have students make a list of all electric appliances in their homes.

Have students also read electric meter during the time of the unit, after instructing them to conserve energy during this time. They are to compare, with your help, the energy used during the normal week prior to the unit when they were taking daily readings to this week of conservation. (We sent a letter to parents asking for their cooperation with conservation week. The standard of living for this week should still be considered adequate by the family.)

Calculations for you to follow through with class: Multiply each week's use by 52 to find consumption for one year. Make the assumption that each student's family is an average family, and that there are 40 million such families in the U.S.

Multiply each students' yearly use on the basis of each of the weeks by 40 million to find total U.S. usage for year in each case.

Subtract the two numbers to find how many KWH of electricity would be saved in the U.S. if people conserved as they had.

Since there are approximately 2000 KWH per barrel of oil, divide saved KWH by 2000 to get barrels of oil saved. Compare figures around the room.

The average electricity use by D.P. & L. customers is 168 KWH per week. Have students decide if they use above or below the average amount.

You may work through this problem any time during the energy unit.

READING
"OUR PRESENT ENERGY SITUATION - HOW WE GOT HERE"

Our nation has been blessed with abundant natural energy resources of wood, coal, oil, and natural gas. We have always been able to obtain these easily and cheaply. Thus our consumption of energy has grown.

Until the 1950's we actually exported more energy commodities than we imported. But the picture has been changing since then.

Since 1950 our total energy use has more than doubled. But our domestic production has not doubled. The reasons for our increased usage of energy include:

1. We pay lower rates when we use more.
2. Promotional advertising for cars, air conditioners, plastics (!), etc. make us all buy more of these.
3. Our expanding highway system encourages more cars and more traveling by car.
4. Subsidies have been given to air travel and trucks, which use more energy than trains.
5. Growth in suburbia, which means we who live there do much more traveling to stores, etc., and use more energy in our homes.
6. Energy has been cheap (the price of energy actually declined in the 1960's) and not a prime consideration in the manufacture of articles.
7. Our food production methods make ever more use of energy-in fertilizers, pesticides, machinery, storage, transportation, etc.

In the 1950's abundant amounts of oil were found in the Middle east. United States companies explored, drilled for, built the necessary equipment, and owned controlling interests in the foreign oil firms. It cost only twenty to thirty cents a barrel to get the oil out of the ground. Not much money was given to the host country. So the oil companies could make a good profit and still sell the oil cheaply. We thought we had a never ending supply.

Oil costs more to produce in our own country than abroad, and therefore we relied more and more on foreign imports. Oil production in this country has actually declined in the past few years. We now import 7,000,000 barrels of oil a day - 1/3 of our total oil consumption.

Coal is our most abundant natural resource, but since 1950 its use has been declining (from 48% to 17% of the market). This means that an ever larger burden must be assumed by oil and gas. Coal use declined for the following reasons:

"OUR PRESENT ENERGY SITUATION - HOW WE GOT HERE"
continued

1. For convenience, people shifted away from coal fired furnaces to those using oil or gas.
2. Coal mining is dangerous, and is a dirty business. Many thousands of miners have been killed and many more have died of black lung disease. There have been new health and safety measures that have made underground mining slower and more expensive. Labor costs have gone up.
3. Trains switched from coal-fired steam engines to oil diesel engines.
4. The Clean Air Act of 1970 made the burning of high-sulfer coal almost impossible. Many utilities changed from coal to oil for production of electricity. Industrial plants also had to shift from coal to oil for the same reason. We became aware of our environment!

Still, few people worried. All that nice, cheap oil was still available from foreign sources.

Natural gas along with oil became ever more popular. The reasons for this popularity are cleanliness, efficiency, convenience, and low cost. However, just as oil exploration in our country was declining, so was exploration for natural gas. There were two main reasons for this:

1. Natural gas is often found with oil, and when oil exploration declined, the associated gas was not found either.
2. The price of natural gas was strictly controlled by the government. Gas companies claim they cannot make enough money from it to look for more. As a result, there is a severe shortage of natural gas this winter. Some people say that there is plenty being stored, just waiting for the price to increase. This would at best be a temporary supply.

As a footnote, it is interesting to note that most of the natural gas associated with the oil wells in the Middle East is just burned off! At present there are very few ships capable of transporting such a cargo.

We suddenly find our source of foreign oil not as available as before or at least so expensive as to cause serious economic problems. The oil companies in the Arab countries and elsewhere have been nationalized. This means that foreigners can decide how much oil we get from them and also how much we pay for it. Prices of oil quadrupled over night. At one point our supply was interrupted by an embargo and this could quite readily happen again.

We also have the political situation in the Middle East to contend with. We are trying to continue our support of Israel and still woo the Arabs. We are trying to maintain peace between them. But the situation is precarious at best.

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HUMAN ECOLOGY

"OUR PRESENT ENERGY SITUATION - HOW WE GOT HERE" continued

We have talked, therefore, about becoming more self-sufficient, energy wise. We find that for the present (probably at least ten years) we do not have enough energy to meet our demands. There are not enough oil fields in production, natural gas is in short supply, coal mine production has declined, nuclear plants have been stalled. It will cost more money to get energy supplies increased. It will take time. In the meantime we have a choice - dependence on foreign oil or CONSERVATION.

QUESTIONS

1. What are the four natural energy resources in the United States?
2. In 1950, the United States shifted from an energy exporter to an energy importer. Give several reasons for this shift.
3. Why did the United States begin to rely on foreign oil imports?
4. Of the four natural energy resources, which is in most abundant supply in the United States?
5. Give your reasons for the declining use of coal as an energy source.
6. Why is natural gas a popular source of energy?
7. Why did the search for natural gas supplies decline in the United States?
8. What technique is being used to bring in gas from the Middle East?
9. What other considerations are important when considering the use of oil imported from the Middle East?
10. What two alternatives are there for meeting our energy demands over the next 10 years.

INVESTIGATING
"OUR ENERGY GROWTH RATE AND ITS IMPLICATIONS"

The United States has about one sixteenth of the world's population, yet uses one third of the world's energy. Perhaps even more disturbing is the fact that one third of the world's population (including the U.S., U.S.S.R., Canada, Japan, and Europe) uses about eighty-five percent of the world's energy, while the remaining two thirds of the population of the world only uses fifteen percent of the energy.

Energy use is the United States is not now even at its peak. Demand is continuing to grow. By 1990, imported oil usage will increase fivefold, coal usage will double, and imported gas will increase tenfold. Fission reactors will expand to equal coal and gas in their productivity. We have said that these fuels are depletable and may only last fifty years. Why do they suddenly seem to be running out? Has our demand been increasing that much? Will it continue to do so with what effects? Can we do something about it?

In the use of any depletable resource, the time period of discovery and development shows little increase in usage. However, after this the curve of rapidly expanding use goes up very quickly to a peak. After this point the usage must drop off, as the source becomes in scarce supply and the costs extremely high. We are now currently approaching that peak or, perhaps, are at it.

Our energy demand has increased about eighteen fold in the last century and in our own lifetimes the use of energy has been raising at a rate of greater than four percent per year. The world's energy use has been increasing at an even greater rate - about six percent per year. In the United States since 1950, our population has increased by about ten percent, residential energy use by about fifty percent, and the country's total energy use by one hundred percent (has doubled). With a relatively small population increase, why would residential energy use increase so much? A few answers are that all homes now (and did not in the past) have central heating, a hot water heater, a stove, a refrigerator, electric lights, a radio, and a television. Most homes today have a washing machine and many air conditioning. Just since 1969 the number of homes with air conditioning has tripled. Dishwashers have increased fourfold in the same period. Many homeowners purchase frostfree refrigerators and color televisions which both use more energy than their earlier counterparts - manual defrost refrigerators and black and white television sets. Transportation energy use (more cars) has grown at a rate of about four percent per year and the average for manufacturing as a whole is about eight percent per year, with some industrial firms using eleven percent more per year. Obviously our energy usage has been increasing and we have had a role in this.

Perhaps more alarming is the fact that this increase in energy demand is projected to continue. A most serious aspect of our projected energy usage is the fact that we have been, are now having, and will have rapid growth in this and other areas if we do not conserve starting now. This growth has been exponential. What does exponential growth mean? Is there a limit to exponential growth?

Which situation would you rather have - your father giving you a dollar a day for a month, or your father giving you a penny the first day and doubling the amount received each day thereafter? The first situation would give you $30.00 and the second situation would give you over $5,363,709 dollars. Most people would prefer the second situation - a good example of exponential growth. Try to calculate it yourself. The first ten days find you with only $5.12 and perhaps wishing you had taken the dollar a day. However, from this point on, your money doubles at an astonishing, or, if you are considering energy usage, alarming, rate. A quantity exhibits exponential growth when it increases by a constant percentage of the whole in a constant time period - like your savings account or like our increase of six percent per year in energy usage.

Let us use another example of exponential growth to show us how fast our energy usage can peak and how limited we really are in our fuel supply if we continue to demand energy as we have been since 1950. This French riddle illustrates the apparent suddenness with which exponential growth approaches a fixed limit - a limit to rapid growth. This is described more fully in the book Limits To Growth listed in the appendix. Suppose you own a pond on which one water lily is growing. This lily plant doubles in size each day. If the lily were allowed to grow at its own rate without stopping it, it would cover the entire pond in thirty days, thus choking off other life in the pond. For many days the plant seems small and you decide not to worry about it - until it covers half of the pond. On what day will that be? How many days will you have to find a solution to your problem? You were correct if you answered the twenty-ninth day. On that day the pond would be half-covered and you would have only one day to rectify the situation. However, would you realize this or on the twenty-ninth day would you just look out and think that you have plenty of time? This shows us that exponential growth does have a limit and the end does come upon us quickly. We have used energy for years without thought. Now we must act quickly to save ourselves - to conserve and not let the other guy take the responsibility for getting us out of this crisis.

The exponential growth of energy usage is made more complicated by the fact that the world population growth, food usage, production of nuclear wastes, and other phenomena are also growing exponentially and each of these problems affects the other. Therefore our energy situation is related to the food problem and the economic problem. We must act now to gain control of and solve these problems as there is a limit to our growth.

ENERGY CONSUMPTION PER CAPITA IN THE UNITED STATES, 1920-1975

Year	Total Energy Consumed (Trillions of Btu)	Resident Population (Thousands)	Total Energy Per Capita (Millions of Btu)
1920	19,782	106,466	186
1925	20,899	115,832	180
1930	22,288	123,077	181
1935	19,107	127,250	150
1940	23,908	131,954	181
1945	31,541	132,481	238
1950	34,153	151,241	226
1951	36,913	153,307	241
1952	36,576	155,680	235
1953	37,697	158,235	238
1954	36,360	161,161	226
1955	39,956	164,309	243
1956	42,007	167,310	251
1957	41,920	170,375	246
1958	41,493	173,332	239
1959	43,507	177,135	246
1960	44,816	179,992	249
1961	45,573	183,057	249
1962	47,620	185,890	256
1963	49,649	188,658	263
1964	51,554	191,372	269
1965	53,969	193,815	278
1966	56,412	195,936	288
1967	58,265	197,859	294
1968	61,763	199,846	309
1969	64,979	201,423	323
1970	67,143	203,185	330
1971	68,698	207,203	332
1972	72,108	208,969	345
1973	74,743	209,844	356
1974	72,300	211,389	344
1975 p	71,078	213,137	333

a. Alaska and Hawaii included subsequent to 1958.
p—Preliminary.

Sources: U.S. Bureau of Mines, U.S. Bureau of the Census and the Federal Reserve Board.

HUMAN ECOLOGY

DATA PROCEDURE

Construct a line or bar graph showing Total Energy consumed on the vertical axis and year on the horizontal axis. Also, construct a graph showing Total Energy per capita on the vertical axis and year on the horizontal. Then answer the following questions:

DISCUSSION

1. How much energy does the United States use in comparison with the other nations of the world?
2. At what rate have we been increasing our energy use?
3. What is our projected energy use?
4. What are the implications of this growth rate? Are there limits?
5. What is exponential growth?
6. Are the energy growth rate and the population explosion related?
7. From your data, do you see any years when the resident population decreased?
8. Were there any years when total energy consumed did not show an increase?
9. What are the years when total energy consumed declined? Can you offer any explanation?
10. What is the average annual increase in population between the years 1960-1975?
11. Why is the total energy per capita the same in 1960 and 1961 when there is more total energy consumed in 1961 than in 1960?

INVESTIGATING "THE NUCLEAR CONTROVERSY"

The question of whether or not the United States should continue to develop and build nuclear power generating facilities and whether or not it should continue to allow its dependence on these facilities to grow for the production of an increasingly large share of the total electric power consumed by the population, has become a hotly debated topic. On one side, we find the proponents of nuclear energy claiming that these installations provide safe, inexpensive, plentiful and environmentally clear energy. On the other side, the opposition complains about the high cost of plant construction, predicts disastrous accidents and the possibilities of sabotage, claims that the uranium reserves are smaller than we think and are about to run out, bemoans the problems of waste storage and disposal, and worries about radiation hazards and genetic defects of future Americans.

When the pro-nuclear forces point proudly to the nuclear industry's outstanding safety record, the anti-nuclear groups counter with charges about the industry's inability to get adequate private insurance. When the proponents point to the fact that nuclear plants will help stamp out air pollution, the opposition points out the routine release of some radioactive materials into the environment. When the industry cites the lower costs of nuclear-powered electricity due to lower fuel costs, the opponents point out costly delays in plant construction and the rising costs of labor and materials. When the anti-nuclear forces accuse the industry of covering up the facts and withholding information from the public, the pro-nuclear groups counter by pointing to the inflammatory rhetoric of the critics' charges and accuse them fo resorting to scare tactics.

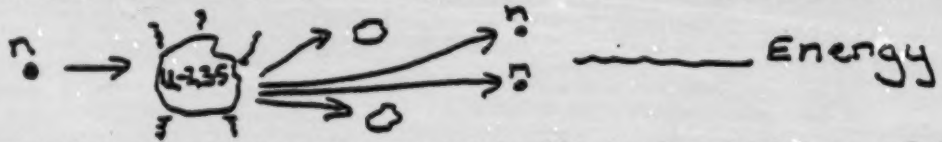
Where is the truth to be found among these charges and countercharges? Exactly what should you as a teacher present to your students about nuclear energy? Because the issues involved are not only complex, but are also of vital national interest, it is recommended that the teacher present both sides of the issues. Emotionalism should be played down. Nuclear energy is in the world to stay regardless of the future policy of the United States.

BEGINNINGS

The beginnings of the nuclear age began with Roentgen's discovery of x-rays in 1896. Becquerel became interested and began his own experiments, and found that uranium emitted a spontaneous energy source of rays. The Curies found that radium emitted an even more intense radio-activity. Becquerel, the Curies, and Rutherford studied the rays given off by radioactive substances. They found three different kinds of emissions — alpha particles (heavy positive charges), beta particles (electrons), and gamma rays (energy rays). In 1905 Albert Einstein equated mass to energy by the following equation: $E=mc^2$, where E is energy, m is mass, and c is the velocity of light. This means that small amounts of mass could be converted to enormous amounts of energy. In 1932 Chadwick demonstrated the existence of an uncharged

BEGINNINGS
continued

particle, the neutron. In 1934 Fermi used neutrons to bombard various elements. Usually the nucleus would capture the neutron, give off a beta particle, and thereby change to the next heavier element. When uranium was bombarded with neutrons, it too gave off a beta particle. Fermi believed that uranium was behaving as the other elements, but Hahn and Strassman, in repeating the experiment, found that instead of a heavier element being produced, two smaller elements were formed. The neutron had thus caused the uranium to split. Large amounts of energy accompanied the split, because the smaller particles and other products were not quite as heavy as the original uranium plus neutron. The lost mass had been turned into energy according to Einstein's equation. Several free neutrons are also formed, which can go on to split other uranium atoms and thus cause a chain reaction.



Uranium occurs in nature principally in two isotopes---U-235 (less than 1%), and U-238 (99%). Of these two isotopes only U-235 will split (is fissionable).

OUR NUCLEAR PAST

In 1941, with the U.S. at war, President F. D. Roosevelt decided to commit the U.S. to the construction of atomic weapons, using the large amount of energy produced in fission for bombs. The secret Manhattan project produced the first controlled chain reaction at the University of Chicago in 1942, and in 1945 the first nuclear bomb was set off in New Mexico. Three weeks later, nuclear bombs, the most terrible weapons ever used, annihilated Hiroshima and Nagasaki and ended World War II. Nuclear weapons produced not only a gigantic explosion, but also tremendous heat, and cover the entire area with dangerously radioactive materials.

Nuclear bombs use pure U-235, allowing the chain reaction to go on uncontrolled. The nuclear reactor, on the other hand, uses only a slightly enriched mixture of U-235 and U-238 (2% - 4% U-235), with a controlled chain reaction.

The Atomic Energy Act of 1946 created the Atomic Energy Commission (AEC). This government agency still directs the development, use, and control of nuclear energy for defense and for peaceful applications. In 1954, the Act was changed so that industry could work with the AEC to develop more users of nuclear energy.

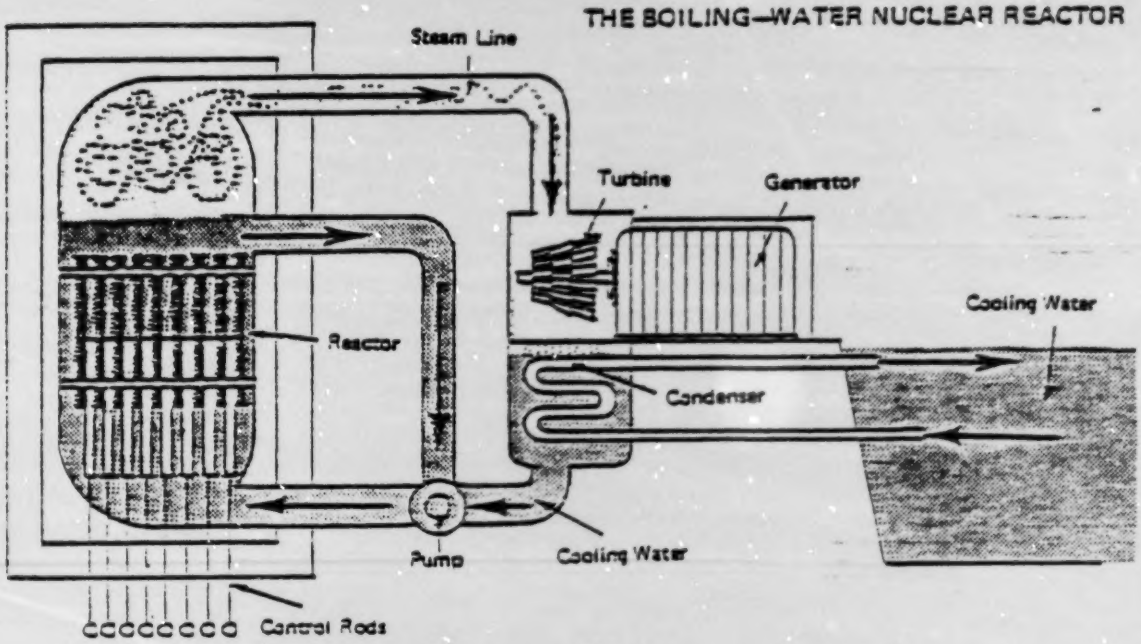
A second change in the Atomic Energy Act came in 1964 when industry was permitted to buy and own nuclear fuel, rather than just lease it from the government.

NUCLEAR FISSION

Nuclear power plants produce energy in a reactor by a process of splitting large atoms into smaller atoms. This process if called fission. A small particle of matter - a neutron - hits the nucleus of a uranium atom and combines with it. Then the whole thing breaks into two large fission fragments releasing a large amount of energy. Two or three free neutrons are also released. The free neutrons strike other uranium atoms, causing more fission and releasing more neutrons to split more atoms. This series of events is called a chain reaction. The large fission fragments produced in the chain reaction heat up the reactor core as they collide with other atoms. Thus, the energy released in fission is converted into heat energy.

The heat produced by fission is used to produce electricity in nuclear power plants. The heat is used, as it is in a fossil-fuel power plant, to change water into steam. The steam spins a turbine. The turbine then runs a generator which produces electricity. The main difference between a nuclear power plant and a fossil-fuel plant is the method used to produce heat. In a fossil-fuel power plant, the heat is produced in a boiler by burning coal, oil, or gas. In a nuclear power plant, heat is produced in a reactor by a controlled chain reaction of uranium atoms. There is another difference between fossil-fuel and nuclear power plants. It is the amount of fuel needed to produce the heat that eventually runs the turbine. One ounce of the uranium fuel that is used in the fission process can produce as much power as 100 tons of coal.

THE BOILING-WATER NUCLEAR REACTOR



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THE BOILING-WATER NUCLEAR REACTOR
continued

The type of reactor most commonly used in the United States today is the boiling-water nuclear reactor.

1. Reactor Core: Small pellets of uranium fuel are sealed in metal tubes. These tubes are combined into bundles and held in place by a grid.

2. Control Rods: When fission is occuring too frequently, a few control rods are inserted into the reactor core. The rods slow down the chain reaction as they absorb free neutrons which might otherwise cause fission. When all the rods are fully inserted between the fuel reactions, the chain reaction stops. As the rods are gradually withdrawn, the power level of the reactor increases.

3. Moderator and Heat Transfer Agent: The water flowing through the core of the reactor does two things. First, it slows the speed of the free neutrons. The slower moving neutrons have a greater chance of causing fission. Second, the water carries heat energy away from the reactor core as it boils and forms steam. The steam is used to generate electric power.

4. Reactor Vessel: Since the reactor produces steam at high temperatures and pressures, a strong housing is needed. The housing also acts as a radiation shield. Harmful radiation from radioactive wastes produced in the reactor is stopped by the reactor walls.

THE PROMISE OF NUCLEAR ELECTRIC POWER

The biggest peacetime use of nuclear energy has been for electricity. The electric utility companies were quick to act in 1954 when the government opened up nuclear technology to industry. Together, the Atomic Energy Commission and the utilities made nuclear electric power into a multi-billion dollar industry.

Nuclear power plants seemed to have many advantages over fossil-fueled plants. For the consumer, the price of nuclear electric power was as low as power produced by other means. And the nuclear power industry promised even lower rates in the future.

Nuclear power stations were quiet and attractive. They also appeared to be clean, producing no visible air pollution.

The producer found the cost of uranium fuel lower than other fuels. (For ten years, the government absorbed some of the cost of producing uranium fuel.) Shipping and storing nuclear fuel was also easier and cheaper since only small quantities of fuel were needed. For example, a million-kilowatt nuclear plant needed only 35 tons of uranium fuel per year. A coal-fired plant of equal power used 2 million tons of fuel per year! A nuclear plant was refueled only once a year. A fossil-fuel plant needed continuous refueling.

THE PROMISE OF NUCLEAR ELECTRIC POWER
continued

Nuclear power appeared to be a clean, cheap, efficient way of meeting the public's demands for more and more electric power. It was also a way of saving valuable fossil fuels for other purposes.

In 1956, England was the first country to provide homes and businesses with electricity from a nuclear power plant. America soon followed and soon outran England in sheer output of nuclear energy. Here, the first big nuclear station began operation in 1957, in Shippingport, Pennsylvania. This plant still provides electricity to the Pittsburgh area. Both power plant "firsts" were constructed near plentiful supplies of water. Later, you will find out why.

By late 1967, eleven nuclear power plants with generating systems larger than 10,000 kilowatts were operating in the United States.

PROBLEMS

The disposal of nuclear wastes is a problem that has not been adequately solved. The wastes are the decay products of the nuclear reactions, and are removed periodically with the insertion of new fuel. The wastes now total 600,000 gallons in the U.S. This amount will, of course, become greater in years to come if the number of nuclear plants increases. The wastes remain radioactive for as long as thousands of years, and must be carefully guarded during this period. At present, only temporary storage tanks are being used. In the future, it is hoped that the wastes can be reprocessed, with useful components being removed, and the remainder of the wastes being stored in some permanent facility. Several methods being considered for this permanent disposal of wastes are: burying them in polar caps, burying them in salt formations, sending them in rockets to orbit and eventually crash into the sun, burial in the ocean in such a way that the wastes will be carried into the earth's core be movements of the earth's plates.

The breeder reactor takes advantage of the fact that U-238 can capture neutrons to produce Pu-239.

$$U\text{-}238 + n \quad U\text{-}239 \quad +Np\text{-}239 \quad +Pu\text{-}239$$

U-238 is the most abundant isotope in nature and, for the most part, is left-over material in ordinary reactors. Since Pu-239 is a fissionable material, it can be used as a fuel. Only a small amount of fuel (U-235 or Pu-239) is needed to operate the breeder, while extra fuel (Pu-239) is produced. Hence the term "breeder reactor" is used.

The use of the breeder reactor extends the life of our dwindling uranium supplies by many hundreds of years. There are, however, some problems with the development of such reactors that have delayed their acceptance into wide usage. The principal problem is that of sabotage, since Pu can be made into a bomb.

PROBLEMS
continued

One other topic that should be covered is the effect of radiation. Exposure to radiation, either from natural or man-made sources, can be harmful to living organisms in a number of ways. Effects of radiation on an organism are classified broadly as somatic effects (those occurring within the exposed organism). An individual who is exposed to a large whole body dose of radiation will suffer immediate illness and/or death. Most somatic effects, however, are the result of repeated, brief exposures and are manifested as higher incidences of cancers and leukemia.

Some radioactive isotopes, when ingested with food, have the capability of concentrating themselves in certain parts of the body. Strontium-90, for example, concentrates in the bones, while cesium-137 concentrates in the muscle tissues and iodine-131 concentrates in the thyroid. Because of this ability, certain radioisotopes do more damage than others. In addition, some radioactive isotopes tend to become concentrated in a food chain in such a way that animals which are on the end of the food chain receive larger doses.

Man is exposed to many sources of radiation. These include occupational sources, medical sources, fall-out from nuclear weapons tests, and natural background radiation that will vary from area to area. The additional exposure suffered by the average person due to the siting of a nuclear power plant near his home is negligible. Only in the case of a highly improbable accident at a reactor or at a fuel processing plant would there be any chance of a harmful exposure of any segment of the public to radiation.

The effects of radiation, and possible exposure to radiation from nuclear power plant accidents and waste materials, are what make the use of nuclear energy such an emotional issue.

Delaware gets roughly 11% of its electricity from two nuclear power plants-160,000 kilowatts from Peachbottom on the Susquehanna River in Pennsylvania, and 82,000 kilowatts from Salem I in Salem, New Jersey. On the national level there are 70 operable nuclear power plants in 26 states supplying about 15% of the country's electricity (1978). The economics of nuclear power, is other issues involving this energy source, are vigorously debated. Most analyses, however, indicate that capital costs for nuclear plants are higher than oil and coal, but fuel costs are less such that the overall cost is in the order oil greater than coal greater than nuclear.

(John Fowler, NSTA, Fact Sheet #12, "Conventional Reactors")

NUCLEAR FUSION

Nuclear fusion is the fusing of hydrogen ions at very high temperatures to form the heavier element helium. Mass is lost during this process and is changed into enormous quantities of energy by Einstein's

NUCLEAR FUSION
continued

formula, $E=mc^2$. This energy could then be used to produce electricity. The energy of the sun comes from this process where 40-billion tons of hydrogen are fused per minute.

Hydrogen occurs largely in nature as light hydrogen (H^1), heavy hydrogen or deuterium (H^2), and tritium that can be used in the controlled fusion reaction. The best source of deuterium is sea water, but tritium must be manufactured from lithium, since the amount of it found in nature is too small. Lithium is fairly abundant in the earth's crust, and sea water is abundant, so that there is sufficient fuel for fusion to last for hundreds of years. If the reaction can be made to occur using only deuterium, there will be sufficient fuel for thousands of years.

In addition to the abundance of fuel, fusion has other advantages. The radioactive by-products are much fewer in number than those of fission reactions. In addition, the reaction does not need to be controlled as does a fission reaction because there is no chain reaction involved.

However, there are stringent conditions that must be met before fusion can take place, and so far research has not completely provided these conditions. Temperatures near 100-million degrees must be reached at high enough density and for a long enough period of time for a reaction to occur.

Many technical problems must be overcome before any of these processes are workable, let along being scaled up for commercial usage. At this point in time, more energy is being put into the reaction than is being produced. Optimists predict a break-through in the 1980's, but most scientists feel that success will be at least several decades in the future.

HUMAN ECOLOGY

ENVIRONMENTAL FACTORS
DATA QUESTIONS

PROCEDURE:

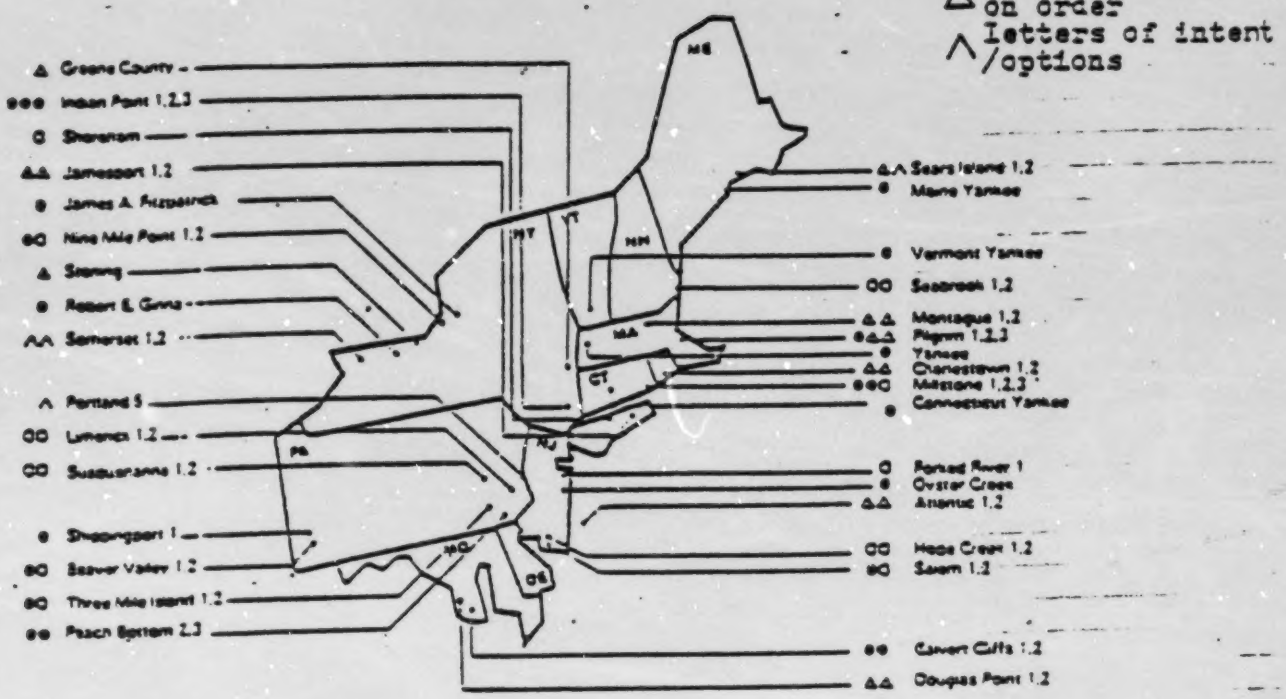
1. Using the accompanying maps, locate the nuclear power plants in operation or planned in the North East.
2. Add the capacities of the reactors operating and calculate the percentage of nuclear power now being generated in the North East.
3. In a similar manner, calculate the planned production percentage.

Then answer the following questions:

1. State 4 arguments for developing nuclear energy.
2. State 4 arguments against developing nuclear energy.
3. Identify the Manhattan project.
4. State the difference between the reaction inside an atomic bomb and an atom reactor.
5. Name and give the functions of the 4 elements of a reactor.
6. State the 4 possible solutions to the waste disposal problem.
7. Explain what is meant by a breeder reactor.
8. Identify the two general classes of radiation effects.
9. Name 3 sources of radiation we are all exposed to.
10. How much electrical power does Delaware receive from nuclear plants.
11. Name the 2 nuclear plants that serve Delaware.
12. How many nuclear power plants are in the U.S.?
13. What is the difference between fission and fusion?
14. Give 3 advantages to fusion.
15. Is fusion a possibility in the near future?

DATA

Key:
- ● with operating license
- ○ with construction permits
- □ limited work authorizations
- △ on order
- ^ letters of intent /options



State and Utility	Plant	Location	Net MWe	Type/Mfr.	Operable
CONNECTICUT					
Connecticut Yankee Atomic Power Co.	Connecticut Yankee	Haddam Neck	575	PWR/W	1967
Northeast Nuclear Energy Co.	Millstone 1	Waterford	690	BWR/GE	1970
Northeast Nuclear Energy Co.	Millstone 2	Waterford	830	PWR/CE	1975
Northeast Nuclear Energy Co.	Milstone 3 (C)	Waterford	1,158	PWR/W	1982
MAINE					
Central Maine Power Co.	Sears Island 1 (C)	Searsport	1,200	PWR/W	*
Central Maine Power Co.	Sears Island 2 (C)	Searsport	1,200	PWR/W	**
Maine Yankee Atomic Power Co.	Maine Yankee	Wiscasset	855	PWR/CE	1972
MARYLAND					
Baltimore Gas and Electric Co.	Calvert Cliffs 1	Lusby	845	PWR/CE	1974
Baltimore Gas and Electric Co.	Calvert Cliffs 2	Lusby	845	PWR/CE	1976
Potomac Electric Power Co.	Douglas Point 1 (C)	Charles County	1,173	BWR/GE	1987
Potomac Electric Power Co.	Douglas Point 2 (C)	Charles County	1,173	BWR/GE	*
MASSACHUSETTS					
Boston Edison Co.	Pilgrim 1	Plymouth	655	BWR/GE	1972
Boston Edison Co.	Pilgrim 2 (C)	Plymouth	1,780	PWR/CE	1982
Boston Edison Co.	Pilgrim 3 (C)	Plymouth	1,150	PWR/CE	*
Northeast Nuclear Energy Co.	Montague 1 (C)	Montague	1,150	BWR/GE	1985
Northeast Nuclear Energy Co.	Montague 2 (C)	Montague	1,150	BWR/GE	1985
Yankee Atomic Electric Co.	Yankee	Rowe	175	PWR/W	1960

III-20

BEST COPY AVAILABLE

NEW HAMPSHIRE					
A[illegible] Service Co. of New Hampshire	Seabrook 1 (C)	Seabrook	1,150	PWR/W	1981
([illegible] Illuminating Co.)					
P Service Co. of New Hampshire	Seabrook 2 (C)	Seabrook	1,150	PWR/W	1983
L d Illuminating Co.)					
NEW JERSEY					
Jersey Central Power & Light Co.	Forked River 1 (C)	Lacey Township	1,120	PWR/CE	1982
Jersey Central Power & Light Co.	Oyster Creek	Toms River	640	BWR/GE	1969
Public Service Electric and Gas Co.	Atlantic 1 (C)	Little Egg Inlet (offshore)	1,150	PWR/OPS	1985
Public Service Electric and Gas Co.	Atlantic 2 (C)	Little Egg Inlet (offshore)	1,150	PWR/OPS	1987
Public Service Electric and Gas Co.	unit 1 (C)	— (offshore)	1,150	PWR/OPS	1990
Public Service Electric and Gas Co.	unit 2 (C)	— (offshore)	1,150	PWR/OPS	1992
Public Service Electric and Gas Co.	Hope Creek 1 (C)	Salem County	1,100	BWR/GE	1982
Public Service Electric and Gas Co.	Hope Creek 2 (C)	Salem County	1,100	BWR/GE	1984
Public Service Electric and Gas Co. (Philadelphia Electric Co.)	Salem 1	Salem	1,090	PWR/W	1976
Public Service Electric and Gas Co. (Philadelphia Electric Co.)	Salem 2 (C)	Salem	1,115	PWR/W	1979
NEW YORK					
Consolidated Edison Co. of N.Y., Inc.	Indian Point 1	Buchanan	265	PWR/B&W	1962
Consolidated Edison Co. of N.Y., Inc.	Indian Point 2	Buchanan	873	PWR/W	1973
Power Authority of the State of New York	Indian Point 3	Buchanan	965	PWR/W	1975
Long Island Lighting Co. (New York State Electric & Gas Corp.)	Jamesport 1 (C)	Riverhead	1,150	PWR/W	1982
Long Island Lighting Co. (New York State Electric & Gas Corp.)	Jamesport 2 (C)	Riverhead	1,150	PWR/W	1984
Long Island Lighting Co.	Shoreham (C)	Brookhaven	820	BWR/GE	1979
New York State Electric & Gas Corp.	Somerset 1 (L)	Somerset	1,220	BWR/GE	1984
New York State Electric & Gas Corp.	Somerset 2 (L)	Somerset	1,220	BWR/GE	1986
Niagara Mohawk Power Corp.	Nine Mile Point 1	Oswego	610	BWR/GE	1969
Niagara Mohawk Power Corp.	Nine Mile Point 2 (C)	Oswego	1,080	BWR/GE	1982
Niagara Mohawk Power Corp. (Power Authority of the State of New York)	James A. FitzPatrick	Scriba	821	BWR/GE	1974
[illegible] Authority of the State of [illegible] York	Greene County (C)	Cementon	1,200	PWR/B&W	1984
Rochester Gas and Electric Corp.	Robert E. Ginna	Rochester	490	PWR/W	1969
Rochester Gas and Electric Corp. (Orange & Rockland Utilities, Niagara Mohawk Power Corp., Central Hudson)	Sterling (C)	Sterling	1,150	PWR/W	1984
PENNSYLVANIA					
Duquesne Light Co.	Shippingport 1	Shippingport	90	PWR/W	1957
Duquesne Light Co. (Ohio Edison Co.)	Beaver Valley 1	Shippingport	852	PWR/W	1976
Duquesne Light Co. (Cleveland Electric Illuminating Co., Ohio Edison Co.)	Beaver Valley 2 (C)	Shippingport	852	PWR/W	1981
Metropolitan Edison Co. (Jersey Central Power & Light Co., Pennsylvania Electric Co.)	Three Mile Island 1	Goldsborough	830	PWR/B&W	1974
Metropolitan Edison Co. (Jersey Central Power & Light Co., Pennsylvania Electric Co.)	Three Mile Island 2 (C)	Goldsborough	880	PWR/B&W	1978
Metropolitan Edison Co. (Jersey Central Power & Light Co., Pennsylvania Power & Light Co.)	Portland 5 (L)	Portland	1,220	PWR/CE	1984
Pennsylvania Power & Light Co.	Susquehanna 1 (C)	Berwick	1,050	BWR/GE	1980
Pennsylvania Power & Light Co.	Susquehanna 2 (C)	Berwick	1,050	BWR/GE	1982
Philadelphia Electric Co.	Limerick 1 (C)	Limerick Township	1,055	BWR/GE	1983
Philadelphia Electric Co.	Limerick 2 (C)	Limerick Township	1,055	BWR/GE	1985
Philadelphia Electric Co. (Public Service Electric and Gas Co.)	Peach Bottom 2	Peach Bottom Township	1,065	BWR/GE	1973
Philadelphia Electric Co. (Public Service Electric and Gas Co.)	Peach Bottom 3	Peach Bottom Township	1,065	BWR/GE	1974
RHODE ISLAND					
New England Electric System	Charlestown 1 (C)	Charlestown	1,200	PWR/W	1983
New England Electric System	Charlestown 2 (C)	Charlestown	1,200	PWR/W	1985
VERMONT					
Vermont Yankee Nuclear Power Corp.	Vermont Yankee	Vernon	540	BWR/GE	1972

ENERGY
"ENERGY SOURCES OF THE FUTURE"

All of our present fuels will be in greater production in the next twenty-five years - oil, coal, natural gas, and nuclear. Of these, nuclear has the potential for increasing the most. Wood does not seem to be an energy source of the future. Its value as a raw material is too great to burn it as a fuel.

One good source for the future that is presently being mostly ignored is the waste of animals and agriculture. These wastes may either be burned as fuel or converted to fertilizer. Feed and food supplements can also come from agricultural wastes. Bagasse, a fibrous by-product of the sugar cane industry, can be used in the manufacture of paper.

Animal wastes now pollute air and water and we consider them a nuisance. But they are a valuable resource. As a fertilizer they could supply approximately 10% of our fertilizer needs. Converted to methane gas by anaerobic digestion they could supply enough methane to be equal to one-half of our present natural gas consumption.

St. Louis, by 1977, will burn all of its trash for the city to provide approximately 15% of its electricity needs. Numerous cities in Europe are already doing this. Disposing of trash is now a big problem in this country. We can turn the problem into an energy solution. Plastics present a problem in burning trash, however, since they give off poisonous gases.

Windpower has been used for years, but had dropped in popularity until just recently. Now, because wind power is non-polluting, renewable, and non-depletable, it is receiving more attention as a source of electricity. The disadvantages are that the wind is intermittent and unreliable. Therefore, a back-up source is needed or also some sort of storage facility such as a battery of fuel cell must be used. Geographical sites that have more wind would be the best places for wind mills.

Tidal electric power depends on the two-directional flow of water with the tides coming in and going out. Where this occurs with a substantial difference in water level in a partially enclosed basin and is controlled by a dam, the electricity production potential is great. Unfortunately, with present technology, not many geographical sites fulfull these requirements. Therefore, the projected capacity for the world's electricity supply is only 2%. France installed a tidal plant in 1966. The Bay of Fundy is being considered as a site (the water level difference between high and low tides is approximately 50 feet!). Russia is also looking into sites.

Hydroelectric power plants supply about 15% electricity in the U.S., much of it in the northwest. Water falls at controlled rates through a dam, spinning turbines which drive generators to produce electricity.

"ENERGY SOURCES OF THE FUTURE"
continued

By the year 2000, hydroelectric power will probably have fallen to 7% of our total output of electricity. However, for the world as a whole, it is a great power source and could provide ten times what has been developed as of now. Hydroelectric power is clear, inexpensive, and requires no mining or processing of fuels. However, the reservoir or lake that forms behind the dam usually covers choice farm land, and eventually (in a century) the reservoir will fill with the silt carried by the river.

Geothermal energy is energy that comes from hot water or hot rocks beneath the earth's surface. The heat is produced by the decay of radioactive materials in the crust and mantle of the earth. The first production of geothermal electricity was in Italy in 1904. New Zealand, the U.S.S.R., Japan, Mexico, and the U.S. have plants in operation for the production of electricity. Iceland uses geothermal energy for space and water heating. They grow bananas in greenhouses warmed by geothermal heat! Steam, such as from geysers or underground fields, drives turbines to produce electricity, a method which is very inexpensive. However, because of the very high mineral content of the water, the machinery is easily harmed. It is difficult to safely dispose of the highly salty waste water. The process is also inefficient. In addition, drilling into the earth possibly may trigger earthquakes. Geothermal energy is a depletable resource, having a lifetime of about fifty years per site.

Breeder reactors may fill the energy gap in the intermediate future. In the breeder, more fuel is produced than is used up, thereby greatly extending our nuclear fuel reserves. However, the materials handled are highly radioactive, and absolute safety has not yet been achieved in the reactor.

Fusion is a potentially fantastic energy source of the future, but probably will not be available for at least twenty-five years, if at all. In fusion, atoms of light elements are joined together to form helium and a great release of energy. The main source of fuel (deuterium which is heavy hydrogen) is found abundantly in sea water. Furthermore, most of the wastes are not radioactive as in the fission process. Enormous technical problems must be solved, however, since temperatures of 100 millions degrees must be reached at high enough density and for a long enough period of time for reaction to occur.

For solar energy much of the knowledge and techniques already exist, but much research needs yet to be done to bring costs down to an affordable level. Certainly much solar energy is available. But the energy is dilute and must be collected over large areas. Also it is intermittent and therefore must be stored. Solar energy has many advantages - it burns no fuel, does not pollute, is readily available, and is a renewable source.

Solar energy is currently being used for small-scale operations such as drying foods, distillation, water heating (Japan), evaporation ponds, refrigeration, ovens, and heating of homes. Since 30% of the world's energy is used for space heating, this last use becomes very important.

"ENERGY SOURCES OF THE FUTURE"
continued

Already several solar houses have been built. These houses have collectors on the roof which transfer heat into water or air, which is then carried to a bin of water or gravel for storage. The heat is then circulated to the living area when needed. These houses are built with adequate insulation, thermal pane windows, and careful construction. The roof is at the proper angle to pick up the maximum amount of energy from the sun. Storage batteries are used to provide electricity on cloudy days, and a supplementary heating system is usually used for the coldest months.

Satellites orbiting the earth have been proposed to collect solar energy on a large scale. These have the advantage of being beyond the reach of clouds. It has also been proposed that large areas of desert be covered with solar energy collectors. Perhaps the energy collected in such a system could be converted to hydrogen and then shipped to where needed.

Perhaps even with solar energy there will be drawbacks. We might upset the earth's heat balance by altering the distribution of solar energy on earth.

There are many energy sources that the earth may draw upon in the future. Hopefully diversity is the key to survival.

ENVIRONMENTAL FACTORS
"Congressional Hearing: The Energy Crisis"

In role-playing, a student can more fully formulate his own attitudes and ideas by gaining insight into the attitudes and ideas of other people. When casting the roles for Worksheet 7, you might find these suggestions helpful:

a. Speaker of the House - The teacher could be cast in this part. You, therefore, will be the one to call the session to order, instruct the Congress as to their objectives, control any discussions which occur, and maintain some semblance of parliamentary procedure.

b. Committee Members and Energy Experts - The teacher should see that care is taken in making suitable assignments in these roles. The roles are critical, and it is suggested that you select students you feel will be best suited to them.

c. Congressmen - Students who prefer to be on-lookers during the mock hearing can be the representatives. Instruct them to listen carefully, since they will be expected to vote at the end of the hearing.

In order to create an atmosphere for the hearing, you might want to try this seating arrangement. The members of the Congressional Committee should be seated in the front of the room with their desks turned to face the class. The energy "experts" should be seated in the rear of the room and called forward by the Speaker as they are needed. You may wish to invite another class to join yours, in order to add to the size of the audience.

In order to give the entire exercise more direction, it is suggested that each role-playing member of the class be briefed concerning his goals. His vested interests should be foremost in his mind as he plans his own proposals and when he votes. Some vested interests are identified below; these suggestions may stimulate other ideas.

ROLE

Committee Member 1 - Represents an oil producing state. Contributions from this industry put him into office. He does not want to raise corporate taxes.

Committee Member 2 - Represents an industrial state. He endorses economic growth and the creation of jobs for his constituents. He also does not wish to raise income or sales taxes.

Committee Member 3 - An environmentalist at heart. He represents a state with a large resort business and many parks.

Committee Member 4 - Represents a state comprised largely of desolate desert-type terrain. He would like to see his

state's population and economy grow.

Committee Member 5 - Represents a state with large urban areas and large energy demands, but little available land. He is concerned about the high cost of energy and high income and sales taxes.

Some key points which the Energy Experts might want to make during their testimony are these:

1. Efficiency Experts (two). Discuss voluntary versus mandatory conservation of energy. Explain how some large modern offices and factories are energy wasters. Stress the need for more mass transit and incentives to encourage car-pooling. These two experts should also support examination of methods to increase the efficiency of our technology, especially in electrical generating plants.

2. Oil Experts (two). Emphasize the conservation of oil and gas resources. Describe how oil is used for products other than fuel. These two experts should delineate the extent of our present supplies and predict the long-term prospects for oil and gas. "Can America become totally independent of foreign oil before other countries use our dependence for blackmail?" should be their key question.

3. Coal Experts (two). Stress the vastness of the United States' reserves. Acknowledge the ecological hazards of strip-mining, but affirm how these hazards can be avoided. Explain the differences between high-grade and low-grade coal, how air pollution has occurred, and how improved technology can eradicate air pollution problems. These two experts should also discuss the processing of our coal reserves into synthetic gas-like and oil-like fuels such as Hygas, Bygas, and Synthane.

4. Nuclear Experts (two). Stress the availability of fuels for both fusion and fission reactors. Mention the potential hazards of transporting radioactive fuels and the problems of leakage or possible theft of fuels, but also emphasize that nuclear energy could potentially be inexpensive to the consumer, compared to other energy sources. Estimate when fusion reactors will be ready and how much their development would cost.

5. Solar Energy Expert (one). Stress the cleanliness, availability, and efficiency of ALL solar-related energy sources. Provide additional information on various projects and methods being developed to harvest and use solar energy. This expert should also give cost estimates concerning large scale operations and give practical target dates for consumer use.

ENVIRONMENTAL FACTORS
"The Energy Crisis"
continued

6. Geologist (one). Explain in detail the techniques used to locate and tap geothermal energy. Explain the risk of causing earthquakes by pumping large amounts of water underground. Name locales where this energy is most feasible.

7. Meteorologist (one). Explain some aspects of efficient windmill design and identify some areas where wind-generated electricity could be used to supplement or even replace conventional fossil fuel plants.

Allow each of the energy "experts" about three minutes to present their materials to the Committee. Then allow three minutes for questions from the Committee. When all the "experts" have testified, instruct the Committee either to approve the President's plan as presented, or to build in amendments or revisions to the five-step program. The Committee should then present its decisions to the rest of the House for final acceptance or rejection.

HUMAN ECOLOGY

ENVIRONMENTAL FACTORS

Lesson 4 - Land Use

3 Days

Instructional Objectives:

Upon completion of this lesson the student should be able to:

1. construct a planned model community on the map which is provided.
2. use verbal arguments in choosing certain priorities for residential, commercial, industrial, and public land use.
3. compare alternative plans and decide on ways of judging their acceptability.

One day is held in reserve for Robert Chartowick - New Castle Engineering Department.

Materials:

3 student activity sheets

Overhead projector (optional)

COMMUNITY SERVICE

HUMAN ECOLOGY

COMMUNITY SERVICE PROGRAM

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COMMUNITY SERVICE DIRECTORY

HUMAN ECOLOGY

COMMUNITY SERVICE PROGRAM

PHILOSOPHICAL OBSERVATIONS

BRANDYWINE HIGH SCHOOL'S
COMMUNITY SERVICE CAREER PROGRAM

The community service - learning movement grew out of the desire of high school Principal, Wayne Von Stetten, to shape educational programs in which service and learning goals were combined. Through such programs both school and student become the full participants in community-life and service - learning becomes a reality.

Students are given the opportunity to learn by doing - to apply academic knowledge to real human problems and to develop greater sensitivities to human needs and human values in flexible and appropriate programs of a widely diversified nature.

HUMAN ECOLOGY

COMMUNITY SERVICE PROGRAM

OPPORTUNITIES

Opportunities are offered to the following:

To high school students who have completed most or all of their academic requirements but wish to try out a variety of career possibilities before college.

To students with a sound academic background but little exposure to the world of public affairs.

To young people who wish to explore various options before entering the working world.

To students who need the time and the learning situation to test out the practical applications of what they have learned.

To students who wish to discover what they can do for themselves and others.

To students in the Human Ecology classes, studying the human condition through time, to learn "to give a little to get a lot" from twenty-five hours of service time in institutional settings ranging from pediatrics to geriatrics.

OBJECTIVE

Human - Community Services learning program's major objective is one of direct action wherein every moment of exposure can relate to a developmental learning situation. Through contact and continuous experience opportunity is provided to serve others and in the process one can serve oneself through the application of useful abilities in a variety of environments. A sense of purpose and a knowledge of potentials and limitations can thus be determined.

HISTORICAL PERSPECTIVE

Dating back to 1970, the program's inception time-line, 1954 students, Grades 10 through 12 have clocked 109,186 hours of service time for an average of 21.7 per student as the table will show.

YEAR	STUDENTS	HOURS	AGENCIES
1970-71	270	14,348	28
1971-72	269	14,500	24
1972-73	136	7,178	15
1973-74	315	17,000	34
1974-75	168	8,400	28
1975-76	91	4,550	26
1976-77	115	5,750	21
1977-78	106	6,360	16
1978-79	120	7,200	19
1979-80	92	5,980	15
1980-81	160	10.140	17
1981-82	112	7,288	18
	1954	109,186	21.7

Yearly average - 9,098 Hours

Variations in numbers of students involved basically centers on a turn-around from heavy placement on school time to almost total after-school hours and weekend volunteer assignments.

QUESTIONS AND ANSWERS

Q. Who is eligible?

A. All students Grades 9 through 12.

Q. Do students get paid?

A. Not in money but in experience and credit.

Exception - only where stipend is necessary to qualify under liability insurance.

Q. How does one earn credit?

A. By completion (25 hours Human Ecology only) 50 hours-100 hours for 1/2 or 1 credit. Special provisions may be made in unique assignments.

Q. What work will students do?

A. That for which they contract with a supervisor that meets each others need and which will have material benefit.

Q. How many experiences can one have?

A. As many as 12 with a minimum of 12 weeks for each over 4 years.

Q. Will service be allowed on school time?

A. Rarely - one is encouraged strongly to use after school and weekend time for the best benefit of all.

Q. Do colleges or employers look upon the program with favor?

A. Yes, very much so. As they see it, it shows initiative, motivation, maturity and responsibility.

Q. How many sites are available for students?

A. Well over 100 of a wide variety. Many possibles unlisted will be negotiated where interest is real and sincere.

Questions and Answers (Continued)

Q. Is transportation a problem?

A. On occasion but in most cases parents or older students cooperate on a team basis.

Q. Will orientation be provided?

A. Yes. At the school and institutional site.

Q. Must I have parent permission?

A. Definitely. A consent form is provided and must be signed by a parent.

Q. What hours and how much attendance is required?

A. Whatever the institutions supervisors insist upon must be consistently adhered to.

Q. Will I have a personal advisor?

A. Your supervisor and school counselor will fill this role.

COMMUNITY SERVICE
STUDENT OBLIGATION AND PARENT CONSENT

Service and Career Exploratory opportunities are available to young people in the Educational, Medical and other allied fields in our community, but only to those who are earnest in their efforts to receive training. It is important, therefore, that each student know what the sponsor and the school expect of him or her.

STUDENT

I am aware that:

1. My obligation to the school does not end when I leave for service. The time spent in Community Service is a school function for which credit is given, and I am subject to all school regulations.

2. I must not terminate my assignment without first consulting the school.

3. I will attend my assigned community service institution regularly and punctually.

4. I will notify my sponsor, as soon as possible, if I am unable to report for assignment.

5. I must demonstrate a conscientious attitude toward both on-the-job duties and in-school assignments.

6. I must comply with any reasonable request, or order or recommendations that my sponsor gives me, as long as I am not asked to do something that is dangerous or illegal.

7. At all times, I must observe all safety regulations at my place of assignment.

8. Transportation on your own and parent permission for participation are prerequisites.

9. At the end of each two-week working period I will provide proof that I have worked.

10. As A REPRESENTATIVE OF BRANDYWINE HIGH SCHOOL, ANY FAILURE ON MY PART WILL RESULT IN TERMINATION FROM THE COMMUNITY SERVICE.

I understand the program and agree to accept the responsibilities outlined above:

Date_____ _____
(Student)

PARENT

I consent to have_____ enter the Community Service Program and agree to cocperate with the school and the training agency.

Date_____ _____
(Parent or Guardian)

BRANDYWINE HIGH COMMUNITY SERVICES

EVALUATION OF AGENCY

(to be filled out by students)

Agency:_____ Supervisor_____
(Institution)
Outline of Service:_____

_____

(Check One)

Was your sponsor:
- available — Yes___ No___
- helpful — Yes___ No___
- understanding — Yes___ No___

Was your orientation:
- satisfactory? — Yes___ No___
- sufficient? — Yes___ No___

Was your volunteer experience:
- meaningful? — Yes___ No___
- interesting? — Yes___ No___
- important? — Yes___ No___
- career defining? — Yes___ No___

Did you get to know co-workers? — Yes___ No___

Were they:
- congenial - helpful? — Yes___ No___
- perceptive - interested? — Yes___ No___

(if applicable) Was transportation:
- available? — Yes___ No___
- regular? — Yes___ No___

Should this opportunity be continued for students? — Yes___ No___

Should your agency continue in the program? — Yes___ No___

Comments and suggestions, please, on the back of this form.

Your signature_____ Date_____

BRANDYWINE HIGH COMMUNITY SERVICES

EVALUATION OF STUDENT VOLUNTEERS

(for Agency Supervisors)

Student Volunteers Name:_____

Sponsor:_____

1. Assigned duties of the volunteer:_____

_____

Kindly check:

2. Volunteer's promptness Good___ Poor___
   adherence to rules, regulations Good___ Poor___

3. If available, would you want same volunteer again? Yes____ No_____

4. What was volunteer's attitude toward assignment?_____

5. Did volunteer establish good rapport with people?_____

6. Was volunteer prepared for assignment?_____

7. Circle one for overall performances:
   Highly satisfactory 10 9 8 7 6 5 4 3 2 1 very unsatisfactory.

Comments on: volunteer/on overall high school volunteer program

_____

_____

Date of evaluation_____Your name_____

BRANDYWINE HIGH COMMUNITY SERVICES

PROGRAM EVALUATION

(for students, agencies and faculty)

1. In general, rate the program by circling one:

   Excellent Very good Good Fair Poor

2. Do you see value in the program: Circle One

   for yourself? Yes No
   for others? Yes No

3. Were you aware of any change in your own attitudes? Yes No

4. Would you participate again? Yes No

5. Was the orientation and training program adequate, useful? Yes No

6. Suggested improvements: _____

   _____

   _____

7. Additional comments: _____

   _____

   _____

Date _____ Signature _____

AREAS OF INTEREST-PLACEMENT OPPORTUNITIES

ANIMAL STUDIES
- Brandywine Zoo

ARTS
- Delaware State Arts Council
- Jewish Community Center

CANDY STRIPING
- Governor Bacon Health Center
- Riverside Hospital
- St. Francis Hospital
- Wilmington Medical Center

CLERICAL WORK
- American Cancer Society
- Big Brothers, Big Sisters
- Bureau for Visually Impaired
- Head Start Day Care Center
- Jewish Community Center
- Margaret Sterck School for the Hearing Impaired

SENIOR/GERIATRIC SERVICES
- Daybreak Lodge Nursing Home
- Emily P. Bissell Hospital
- Foulk Manor Home (No. & So.)
- Milton and Hattie Kutz Home
- New Castle Cty. Senior Serv.
- Veterans Adminis. Hospital

SPECIAL CHILDREN'S PROGRAMS
- Beechwood Individualized Parent-child Program
- Charles W. Bush School
- Head Start Day Care Center
- Jewish Community Center
- John G. Leach School
- R.O.M.P. Discovery Center
- St. Davids Preschool
- Terry Children's Psychiatric Center

THERAPY: Occupational, Recreational, Physical, etc.
- Delaware Curative Workshop, Inc.
- Delaware State Hospital
- Delaware State Hospital for the Chronically Ill
- Margaret Sterck School for the Hearing Impaired
- Veterans Administration Hospital
- Wilmington Medical Center

TUTORING
- Holy Trinity Luthern Church-Outreach Program
- Margaret Sterck School
- Neighborhood House, Inc.
- West End Neighborhood House

SOCIAL WORK-VARIED SERVICES
- American Cancer Society
- American Red Cross
- Delaware Youth for Human Services
- Division of Social Services
- Head Start Day Care Center

AREAS IN WHICH VOLUNTEERS MAY SERVE

ARTS/CRAFTS

BLOOD BANK

CANDY STRIPING

CAST ROOM

CENTRAL INFORMATION

CENTRAL SUPPLY

CHILD DIAGNOSTIC AND DEVELOPMENT CLINIC

CHILD LIFE DEPARTMENT
- IN-PATIENT
  - ADAPTIVE PHYSICAL EDUCATION
  - CHILDREN'S LIBRARY
  - PLAYROOM
  - SWIM PROGRAM
  - WARDS
- OUT-PATIENT
  - MOBILE UNIT
  - PLAYROOM

CLERKS/TYPISTS

CLINICAL RESEARCH

DAY CARE

DIETARY DEPARTMENT

EMERGENCY

FAMILY SERVICES

FOOD SERVICES

GERIATRICS

HANDICAPPED

HORTICULTURE THERAPY

HOUSEKEEPING DEPARTMENT

LIBRARY

MAIL/FLOWERS

MEDICAL DIRECTOR'S OFFICE

MEDICAL RECORDS

MENTAL HEALTH

MUSIC

NATURE STUDY

NURSING SERVICES

OCCUPATIONAL THERAPY

OUT-PATIENT DEPARTMENT

PEDIATRICS

PERSONAL SERVICES

PHARMACY

PHYSICAL THERAPY DEPARTMENT

RECREATION

REHABILITATION

RESEARCH DEPARTMENT

SCHOOLS AND TUTORING

SEWING

SPECIAL FRIENDS

SPEECH AND HEARING DEPARTMENT

SWITCHBOARD

TELEPHONE COMMITTEE

TOURS OF THE INSTITUTE

TUTORS - MULTIPLE SUBJECTS
ELEMENTARY/SECONDARY

X-RAYS

COMMUNITY SERVICE DIRECTORY

Arrangements can be negotiated by an individual or staff sponsor for community service and a relevant career learning experience at the following sites:

1. American Red Cross, Delaware Chapter - 910 Gilpin Avenue Wilmington, 19808 - 655-3341-Mrs. Caroline Short.

2. American Diabetes Association - 2713 Lancaster Ave. Wilmington - 656-3330.

3. Arthritis Foundation - 234 Philadelphia Pike - 764-8254, 762-4942.

4. Ala-Teen - 18-B Trolley Square, Wilmington, 19806 - 655-5133.

5. American Cancer Society - 1925 Lovering Ave. - 654-6267.

6. Armed Services Recruiting - 1001 Jefferson St., Wilmington 573-6119.

7. Bureau for the Visually Impaired - 305 W. 8th Street, Wilmington, DE 571-3333.

8. Brandywine Social Club - Mrs. Karen Groundland-421-6661.

9. Big Brothers/Big Sisters - 701 Shipley St. Wilmington 19801 654-5301 - Ms. Patricia Hunt.

10. Brandywood Elementary School - 2115 Anson Rd. - 792-3966.

11. Alfred I. duPont Institute - Box 269 Rockalnd Rd. Wilmington 19899 - 573-3099 - Lynn Harrison.

12. Brandywine Zoo - Wilmington - 571-7747 - Carol Barnett.

13. Boy Scouts of America - 8th & Washington St., Wilmington 652-3741 - Larry Bartram.

14. Boys Club of Wilmington, Inc.-669 S. Union St., Wilmington 19806 - 658-1870.

15.* AFL-CIO Community Services - 573-2443 or 573-2440.

16. Brandywine River Museum - Route 1, Chadds Ford, PA

Community Service Directory (Continued)

17. Claymont Community Center - 3301 Green St., Claymont 19703 - 792-2757.

18. CONTACT - Washington St. & Lea Blvd. Wilmington, 19802 Helpline - 575-1112; Deaf Contact - 656-6660.

19. Concord Presbyterian Pre-School - Foulk & Murphy Roads Wilmington, 19803 - 654-9652.
Carrcroft Elementary School - 503 Crest Rd., 429-4363

20. Children's Bureau of Delaware - 2005 Baynard Blvd., Wilmington, 19882 - 658-5177.

21. Children's Home, Inc. - 2901 Green St., Claymont, 19703 798-0601.

22. Delaware Adolescent Program - 14th and Market Streets, 652-8274.

23. DIAL - 501 W. 11th Street, Wilmington, 19801 - 738-5555.

24. Delaware Opportunities Industrialization Center, 813 West Street, Wilmington, 19801 - 654-8205.

25. Delaware Curative Workshop - 1600 Washington St., Wilmington 19802 - 656-2521.

26. Delaware State Hospital

27. Darley Road Elementary School - Darley Road, 792-3916.

28. Division of Social Services - State Adm. Delaware State Hospital, New Castle - 42106734.

29.* Charles W. Bush School - 101 Whitby Dr., 429-4410.

30. Easter Seal Society for Crippled Children and Adults - 2705 Baynard Blvd. 658-6417.

31. Delaware Heart Association - 4 Trolley Square - 654-5269.

32. Delaware Elwyn Institute - 1209 Orange St., 658-8860.

33. Delaware Nature Center - Brackenville and Barley Mill Road - Ashland Center - 239-2334.

34. Delaware State Arts Council - Wilmington, 571-3540.

35. Delaware Vocational Rehabilitation - Carvel State Bldg., Wilmington - 571-2850.

Community Service Directory (Continued)

36. Emily F. Bissell Hospital - 3000 Newport Gap Pike - 995-8400 - Mrs. Jane McVey.

37. Evan-Bach Pre-school - 2800 Silverside Road, Wilmington 478-5921.

38. Ferris School for Boys - Center and Foulkland Roads - 995-8200.

39.* EYE - 206 W 10th St. - Wilmington - Rick Brooks-658-7831.

40. Family Court - 900 King St. - 571-2200 - Ms. Janice Fehnel.

41.* Explorers - 8th & Washington Sts., Wilmington, 19801 - 652-5741.

42. Geriatric Services of Delaware, Inc. - 1304 N. Rodney St., Wilmington, 19806 - 658-6731.

43. Girls Club of Delaware, Inc. - 1019 Broom St.,Wilmington, 19806 - 656-1697.

44. Goodwill Industries - 17th & Spruce Sts, Wilmington, 19802 652-3275.

45. Headstart - 1105 Madison St. Community Action - 658-4310.

46.* Foulk Manor North - 1200 Foulk Road
Foulk Manor South - 407 Foulk Road 655-6249

47. Hagley Museum - Barley Mill Road and Brandywine Creek, Greenville - 658-2400.

48. Independent Living - Claymont - Kathy Ball, Audrey Davis 328-4316.

49. Jewish Community Center - 101 Garden of Eden Road, Wilmington 19803 - 478-5660.

50. Holy Trinity Lutheran Church (Outreach Program).

51. Girl Scouts - 8th and Washington Streets, Wilmington - 652-3741.

52. Kutz, Hattie Home - 704 River Road, Wilmington, 19809 764-7000.

53. Kingswood Community Center - 23rd and Bowers Streets, Wilmington, 19802 - 764-9022.

Community Service Directory (Continued)

54. Luther Towers - 1201 N. Harrison St.- 652-8597;
1420 N. Franklin St. - 654-4490.

55. Intensive Learning Center - Springer Jr. High School, 2220 Shipley Road, 429-4421.

56. Forwood Elementary School - 1900 Westminster Drive, 792-3956.

57. Lombardy Elementary School - 412 Foulk Road - 429-4450.

58. Lancashire Elementary School - 2000 Naamans Road - 792-3890.

59. Maple Lane Elementary School, Maple Land Rd.,- 792-3906.

60. Monteith School - 1310 Brandywine Blvd. - 762-6353.

61. March of Dimes - 1208 Drummond Plaza Office Park, Newark - 737-1310.

62. Mental Health Association - 1813 N. Franklin Street, Wilmington, 19802 - 656-8308.

63. Multiple Sclerosis Society - 571-9956 - Trolley Square Wilmington - 571-9956.

64. Muscular Dystrophy Association - 1 Pike Creek Center Wilmington - 994-0921.

65. John G. Leach School - Landers Lane, New Castle-429-4055.

66. Margaret Sterck School for the Hearing Impaired - Chestnut Hill Road, Newark - 454-2000.

67. Mary Campbell Center - 4641 Welden Road, Wilmington - 762-6025.

68. Leukemia Society, 824 Philadelphia Pike, Wilmington - 764-7700.

69. Montessori School of Talleyville, 850 Mt. Lebanon Road, Talleyville - 652-8411.

70. Ichthylogical Associates - 100 S. Cass St., Middletown, DE - 834-7944.

71. Methodist Country House - 4830 Kennett Pike, Wilmington, 654-5101.

Community Service Directory (continued)

72. Pilot School - 100 Garden of Eden Road, Talleyville - 478-1740.

73. People's Settlement Association - 408 E. 8th St., Wilmington, DE 19801 - 658-4133.

74. New Castle County Library.

75. New Castle County Parks and Recreation - 2701 Capitol Trail, Newark - 366-7791 - Jody Amberly.

76. Peer Counselors - Counseling Office - Brandywine High School.

77. Riverside Hospital - Box 845 - 700 Lea Blvd., Wilmington Cissie Golden - 764-6120.

78. RSVP - Wilmington - Mrs. Barbara Corrozi - 368-6874.

79. Rodney Day Care Center - 1502 W. 13th, Wilmington - 654-5521.

80. R.O.M.P. Discovery, 2105 Baynard Blvd, Wilmington - 655-8905.

81. St. Paul's Pre-school - 1314 Foulk Road, Wilmington - 478-3135.

82. St. David's Pre-school - 2320 Grubb Road, Wilmington - 475-3747.

83. St. Francis Hospital - 7th & Clayton Sts., Wilmington - 421-4100.

84. The Salvation Army - 401 Shipley St., Wilmington 19899 - 656-1667.

85. SERVE - Wilmington Senior Center, 1901 Market St., Wilmington - 651-3420.

86. Sienna Hall - 2307 Kentmere Parkway, Wilmington - 656-2183.

87. South Wilmington Neighborhood House - 1218 B Street Wilmington - 652-3928.

88. S.P.C.A. - Route 7 Stanton - 998-2281.

89. Special Olympics - Contact Brandywine High Counseling Office.

Community Service Directory (continued)

90. Terry Psychiatric Center - 10 Central Avenue, New Castle - 421-6660 - Karen Groundland.

91. UNICEF - Contact Brandywine Counseling Office for details.

92. United Cerebral Palsy - 701 Shipley St., Wilmington - 656-8131.

93. Veterans Administration - 1601 Kirkwood Highway, Wilmington - 994-2511 - Jack Shattuck.

94. Wilmington Medical Center - 14th & Washington Streets, Wilmington - 428-2206 - Berta Opperman.

95. Wilmington Senior Center - 1801 Market St., Wilmington, 19802 - 658-8033.

96. West End Neighborhood House, 710 N. Lincoln St., Wilmington, 19805 - 658-4171.

97. Winterthur - Kennett Pike - 656-8591; 428-1411.

98. WHEELS - 3350 Foulkland Road, Wilmington - 571-7735.

99. WMPH - Counseling Office - Mt. Pleasant High School - Wilmington - 429-4335.

100. Talleyville Fire Station - Contact Chief.

101. Tutors - Reading - Elementary - Secondary Subjects - Counseling Office Brandywine High School - 429-4477.

102. Patterning - Individual arrangements as requested.

103. YMCA - Brandywine Branch - 3 Mt. Lebanon Road, Wilmington 19803 - 571-6911.

104. Group opportunities: Contact Brandywine Counseling Office 429-4477:

Toys for Tots	Adaptive Aquatic Teams
Craft/Art/Music Serv.	Athletic Scrimmages, Practices

Demonstrations at Institutional Sites.
Dramatic/Theatre Arts/Industrial Arts.
Extra-curricular - Key Club, FBLA, DECA
Activity Projects - Student Council

105. Individual Assignments: Administrative, Teacher, Counselor, Library, Special Education Aides - other possibles: Landscaping, Veterinarians, Nature Center, Horticulture, Architects.

*All listed institutional placements will require counseling office contact and screening as well as parental permission. Academic credit will be awarded for successful endeavor in any assignment on the basis of 1/2 to 1 credit for 50 or 100 hours. Eligibility will extend from 9th through 12th grades with a minimum of 12 weeks and 50 hours for credit approved, thus allowing those seeking extensive career exploration a possible twelve service learning experiences over four years. Precise statements of student's accomplishments will be carried on an individual's transcript.

BIBLIOGRAPHY

BIBLIOGRAPHY

Articles

ED165903 - Pre-Parenting Training: Adopter's Guide

Based on a pilot in ten Oregon High Schools, this adopter's guide describes a training program designed to prepare high school students to be mentally and emotionally healthy parents.

ED158180 - Program, Services, and Approaches Toward the Reduction of Adolescent Pregnancy, Final Report.

This field survey relative to adolescent pregnancy was undertaken through site visits and interviews.

ED158160 - Education for Parenthood: Program, Curriculum, and Evaluation Guide.

Assistance in developing effective preparation for parenthood program for teenagers.

ED145112 - Child Development

This curriculum guide presents a course of study in child development for secondary level.

ED143765 - Presenting Tomorrow's Handicapped Child Today

To educate junior high school students in the care of infants and young children, to prevent or decrease problems that might develop.

ED143744 - Parenting the Culturally Different

Information on working with parents of culturally different youth.

ED135465 - Day Care Youth Helper Program

A program designed to give high school and jr. high school students an opportunity to work with preschool children through field experience.

ED155826 - The Human Ecology of School Crime (Chap. 11: Theoretical Perspectives on School Crime)

This chapter examines the human ecology of school crime.

ED155826 - Social Studies Strands Goals and End-of-Twelfth-Grade Objectives

Strands are areas within social studies in which students need competency by the end of high school. One example is to develop a positive self-concept.

ED130891 - A Field Study in Human Ecology. Aids to Individualize the Teaching of Science, Mini-Courses.

ED108890 - Horse Manure and Other Fun Projects

Nine chapters are included in the guide, one of which is on Human Ecology.

BIBLIOGRAPHY

Magazines

EJ178862
"Teaching Parent Education in the Secondary School: The Role of the Home Economics Teacher." Vogel, Virginia L. Illinois Teacher of H. EC. 21.4. 197-9 Mar-Apr '78.

EJ155620
"Selecting Media for Parent Education Programs." Bjorklund, Gail. Young Children, 32, 2, 14-18 Jan '77.

EJ142721
"Suggestions for Teaching Freshman-Sophmore Child Development" Puechler, Barbara. Family Coordinator 25, 3, 303-304. Jul ' 76.

EJ137667
"Parent Education as Provided by Secondary Schools." Kerckhoff, Richard K. Family Coordinator 25, 4, 127-130. Apr '76.

EJ119043
"The Child's Right to Have a Trained Parent". Bell, T.H. Elementary School Guidance and Counseling, 9, 4, 271-276. May '75.

EJ111591
Urban Climates and Human Ecology. (Author/JR)

EJ098461
The Cemetery--Setting for Multidisciplinary Learning. (Discovery of many concepts in human ecology.) JR

"What's Right with Education", Phi Delta Kappan. Nov. '79.

Growing Child (Subscription to this magazine)

ED093612 - Human Ecology and the Health Dangers

Instruction on communicable diseases, prevention of diseases, and the optimal environment (pure food, water, air, waste disposal methods, pesticides, radioactivity and the effects the laws governing each one have on human life.)

ED086522 - Human Ecology, Science

The scientific study of the close relationship between envolving human behavior and changing environmental conditions.

ED062188 - Environment: Reading for Teachers

Twenty-seven articles, one of which is on Human Ecology, advocating in the final section the use of modern science teaching techniques in the study of components of environmental change.

ED043075 - Evolution of a Human Ecology Curriculum from Home Economics: a proposal for high school

Proposed is the development of an ecology curriculum at the secondary school level by home economics instructers in conjunction with teachers in biology, health, social science, etc.

ED169858 - Deliberate Psychological Education: Growth Through Human Understanding

Training manuals developed to facilitate the career guidance programs on the secondary level.

ED147216 - The Cost and Value of American Children: A Teaching Module

Contains questionnaires, a form for combining questionnaire responses, and seven data sheets dealing with costs and benefits of rearing children in the U.S.

ED001916 - Early Identifuication of Behavior Problem Children and Multi-Problem Families

A significant proportion of young children with school problems reflects a family with problems.

BIBLIOGRAPHY

Books and Booklets

The City Kids' Teachers' Book. Ontario Institute for Studies in Education. 130p. 252 Bloor St. West, Toronto, Ontario M5S (#7.75)

Educational Accountability: Beyond Behavioral Objectives. Arthur W. Coombs. ASCD. 1972. 46. ($2.50)

Family Counseling: A Systems Approach. Laura Sue Dodson. Accelerated Development Inc., 1979. 2515 W. Jackson St. P.O. Box 667, Muncie, ID

Humanistic Education: Objectives and Assessment. Arthur W. Coombs. ASCD. 1978. 64p. ($4.75)

Improving Education Assessment and An Inventory of Measures of Affective Behavior. Walcott H. Beatty. ASCD. 1969. ($4.50)

Lifelong Learning -- A Human Agenda. Norman V. Overly. ASCD. 1979. 200p. ($9.75)

Life Skills in School and Society. Louis J. Rubin. ASCD. 1969. 182p. ($5.50)

Making Learning Environments More Effective. Dewayne Kurpius. Accelerated Dev. Inc. 1979.

Man's Impact on the Environment. T.R. Detwyler. McGraw Hill. 1971.

PACT (People Acting for Change Together): Resource Packets. Wayne County Community College, 4612 Woodward Ave., Detroit, MI 48201 ($20.00)

The School of the Future - NOW. J. Galen Saylor. ASCD. 1972. 136p. (#3.75)

The New Model Me - High School Book. A curriculum guide designed to help students cope with frustration and aggression, 1973. Lakewood City Public School System. 1470 Warren Road, Lakewood, Ohio and The Educational Research Council of America. The Rockerfeller Building, Cleveland, Ohio.

Passages: Predictable Crises of Adult Life. First edition. New York, NY. Dutton Company. 1976. HQ/1064/US/s522/1976. Paperback $3.50

The Seasons of a Man's Life. Levinson, Daniel J. [et.al.] First Edition. New York, NY. Knopf, C. 1978. BF/724/6/542/1978 $10.95.

"First Three Years of Life" Burton White. Avon. 959 Eighth Ave., New York, NY 10019. 1978. Paperback $4.95

AVAILABLE MATERIALS BRANDYWINE HIGH SHCOOL

FILMSTRIPS

"Changing Human Behavior: Behavior Modification"
Human Relations Media (3 f/s, 3 cas.)
"Coping with Life: The Role of Self Control"
Human Relations Media (2 f/s, 2 cas.)
"Dealing with Stress"
Human Relations Media (2 f/s, 2 cas.)
"Exploring American Values: The Meaning of Equality"
Human Relations Media (3 f/s, 3 cas.)
"The Good Marriage: It Just Doesn't Happen"
Sunburst (3 f/s, 3 cas.)
"Suicide: Causes and Prevention"
Human Relations Media (3 f/s, 3 cas.)
"Teenage Pregnancy and Prevention"
Human Relations Media (3 f/s, 3 cas.)
"Today's Family: A Changing Concept"
Current Affairs (1 f/s, 1 cas.)
"Why We Do What We Do: Human Motivation"
Human Relations Media (3 f/s, 3 cas.)
"Your Emotions: The Coping Process"
Sunburst (2 f/s, 2 cas.)

Priority One Environment Program. Pollution Control Education Center
Township of Union Public Schools, Union, NJ., 1975
"Air Pollution and Your Health" (2 f/s, 1 cas., 49 stud. book, other mat.)
"The Energy Challenge" (2 f/s, 1 cas., 22 s.b., other mat.)
"Open Lands and Wildlife" (3 f/s, 1 cas., 29 s.b., other mat.)
"Protecting Our Water Supplies" (2 f/s, 1 cas., 30 s.b., other mat.)

SLIDES
"Family Crisis: When Parents Divorce"
The Center for Humanities, Inc. 2 carousels, 2 cas.)
"How to Live with Your Parents and Survive"
The Center for Humanities, Inc. (1 carousel, 1 cas.)
"Who's OK, Who's Not OK? An Introduction to Abnormal Psychology"
The Center for Humanities, Inc. (2 carousels, 2 cas.)

BOOKS
The American Family: Life-Styles in a Changing Society
Xerox Education Publications, 1975

FILMSTRIPS - ADDITIONAL BRANDYWINE HIGH SCHOOL

Sunburst Communications, Pleasantville, N.Y.

Marijuana Bulletin: A Research Update (1 f/s, 1 cas.)
Sexually Transmitted Diseases: An Update (3 f/s, 3 cas.)
Getting Through the Bad TImes: Teenage Crisis (3 f/s, 3 cas.)
Managing Stress: Anxiety & Frustration (4 f/s, 4 cas.)
Alcohol & Teenagers: Why & Why Not? (3 f/s, 3 cas.)
Genetics: How Life Remakes Life (3 f/s, 3 cas.)
OK To Be Old: Approaches To Aging (3 f/s, 3 cas.)
Preventing Teen Suicide: You Can Help (3 f/s, 3 cas.)
OK To Say No: The Case for Waiting (3 f/s, 3 cas.)
Do I Want To Be A Parent? Now? Ever? (2 f/s, 3 cas.)
Nutrition for Teenagers Only (3 f/s, 3 cas.)
Adolescent Conflict: Parents vs. Teens (2 f/s, 2 cas.)
Preparation for Parenthood (3 f/s, 3 cas.)

Bill Doring Co., King of Prussia, PA.

Our Polluted World: The Price of Progress
Nuclear Energy: To Hot to Handle
Deadly Chemicals: Who's Minding the Store
The Energy Crisis: Waste, Indecision, Indifference

Human Relations Media, The School Shelf, Southampton, PA.

Eight Stages of Human Life - Pre-natal to Late Childhood (4 f/s, 4 cas.)
The Eight Stages of Human Life - Adolescence to Old Age (4 f/s, 4 cas.)

BIBLIOGRAPHY

RESOURCE CENTERS

A. DELAWARE STATE DEPARTMENT OF PUBLIC INSTRUCTION

RESOURCES

* COMPUTER ACCESS to DIALOG Information Services' databases (including ERIC, Exceptional Child Educational Resources, Resources in Vocational Education, Sociological Abstracts, Dissertation Abstracts, and more)

* ERIC microfiche collection (Educational Resources Information Center) THE ONLY ONE IN DELAWARE

LIBRARY INFORMATION CENTER
Townsend Building, Dover
P.O. Box 1402, Dover, De. 19901
Telephone: 736-4692
Hours: weekdays, 8-4:30
Contact: Richard L. Krueger, Library Spec.

B. MARCH OF DIMES - BIRTH DEFECTS FOUNDATION

PUBLICATIONS & AUDIOVISUALS

Delaware State Chapter - 1208 Drummond Plaza Office Park
Newark, De. 19711

Phone: (302) 737-1310

CATALOG OF PUBLIC HEALTH EDUCATION MATERIALS - Example:

EDUCATIONAL KITS:

* Starting a Healthy Family - is an interdisciplinary program that draws upon fields of medicine, community health, adolescent psychology, social sciences and biology. It can be easily integrated into classes for health, home economics, life planning, life sciences, biology or social studies for junior and senior high school students.

* Preparenthood Education Program (PEP) - An innovative program focusing on health care and nutrition during pregnancy. Designed primarily for school-age parents, PEP is equally appropriate for general use in junior and senior high schools, prenatal care clinics, hospitals, WIC sites and health departments. Materials are easy to read, colorful and attractive.

HUMAN ECOLOGY

GUEST INSTRUCTORS

NAME	ORGANIZATION	POSITION	TOPIC
Peter Schindler, M.D.	A.I. duPont Institute	Psychiatrist	"Origin and Types of Mental Problems"
Ian James	duPont Company	Economist	"State of the Economy"
Lee Anderson	A.I. duPont Institute	Child Development Specialist	"Early Childhood 0-5"
Dr. Wayne Adams	A.I. duPont Institute	Psychologist	"Parenting and Divorce"
Linda Nicholson	A.I. duPont Institute	Geneticist	"Genetic Counseling"
Pat Moore	A.I. duPont Institute	Nutritionist	"Pre-natal Care"
Lee Anderson	A.I. duPont Institute	Child Development Specialist	"Infant Stimulation"
Paul Morrison	Brandywine School District	School Psychologist	"Teenage Suicide"
Rich Maichle	A.I. duPont Institute	Social Worker	"Family Therapy"
Steve Morres	D.I.A.L.	Counselor	"Peer Relationships"
Jeff Quinzer	Division of Aging	Program Developer	"Treatment & Care of the Elderly"
Christa Brinker	March of Dimes	Regional Coordinator	"Prevention of Birth Defects"
Dr. Joseph D. Irr	A.I. duPont Company	Genetic Toxicologist	"Genetics and Toxicology"
Dr. Barbara Settles	University of Delaware Dept. of Family Studies	Professor	"American Family"

STUDENT WORKBOOK

A HIGH SCHOOL PROGRAM IN HUMAN ECOLOGY:

Helping Everyone Live Productively

HUMAN ECOLOGY SURVEY

PLEASE RESPOND TO THE FOLLOWING STATEMENTS CONCERNING THE PRESENT HUMAN CONDITION.

① STRONGLY AGREE	② AGREE	③ N.O.	④ DISAGREE	⑤ STRONGLY DISAGREE

1 2 3 4 5 O O O O O	1. Human nature being what it is, there will always be war and conflict.
1 2 3 4 5 O O O O O	2. Once a person is suicidal, he is suicidal forever.
1 2 3 4 5 O O O O O	3. There is little that can be done about the quality of family life in America.
1 2 3 4 5 O O O O O	4. The failure of marriages in the U.S. is caused more by environmental pressures than by personality conflicts.
1 2 3 4 5 O O O O O	5. Crime can be deterred.
1 2 3 4 5 O O O O O	6. Illegitimacy can be prevented through sex education in the schools.
1 2 3 4 5 O O O O O	7. I am my brother's keeper.
1 2 3 4 5 O O O O O	8. Senior citizens fare best when surrounded by people their own age.
1 2 3 4 5 O O O O O	9. School courses can raise the quality of human life.
1 2 3 4 5 O O O O O	10. Life in the U.S. will get worse until it gets better.

HUMAN ECOLOGY SURVEY (CON'T.)

1	2	3	4	5	
O	O	O	O	O	11. Psychology offers little in the way of solving problems.
1	2	3	4	5	12. The study of genetics is best left to geneticists.
O	O	O	O	O	
1	2	3	4	5	13. Once a personality is formed in childhood, it will change very little.
O	O	O	O	O	
1	2	3	4	5	14. Peers (people your own age) are not equipped to realistically help their friends.
O	O	O	O	O	
1	2	3	4	5	15. Prejudice is caused most by a lack of information.
O	O	O	O	O	

Human Ecology Course - Religion Survey

If you do not wish to identify yourself, use 3 digit number.

1. Are you a member of any organized religion? Yes___ No___

2. If yes, answer the following questions:
   a. How frequently do you attend religious services? At least once a week___ At least 2-3 times a month___ At least once a month___ At least once a year___. Less frequently___
   b. Do you participate in other religious activities (youth groups, meetings, social affairs, etc.)? Yes___ No___
   c. What is there about your religion that attracts you to it?

   d. In what way(s) has your religion influenced your life?

3. If no, answer the following questions:
   a. Have you attended any religious services in the past 5 years? Yes___ No___. If yes, approximately how many? ___
   b. What is there about organized religion that keeps you from being attracted to it?

   c. Do you feel that you have missed anything by not being a member of some religion?

HUMAN ECOLOGY
FAMILY SURVEY

This is a survey to establish some data and statistics concerning this class. Do not identify yourself by name. If you want this survey returned, put a 3 digit number on it in the top right corner so you can identify it.

1. a. Do you have any consanguinal brothers and/or sisters?
Yes____ No___

b. If yes, how many are younger? brothers___ sisters___
older? brothers___ sisters___

2. If you answered yes to 1.a., rate your relationship to each on a scale from 1 to 10 [with 1 being terrible and 10 excellent]. Identify each sibling as, for example, younger brother #1, older sister #2, etc.

3. a. Are any of your brothers or sisters not living with you?
Yes___ No___

b. If yes, indicate which ones and why.

4. If you could change the behavior of your brother[s] and/or sister[s], what would you change? [Indicate for each, identifying each as in #2].

5. If you could change your own tehavior toward your brother[s] and/or sister[s], what would you change?

6. Are your parents: [Check all appropriate items. If an item is appropriate to only one, use "M" for mother or "F" for father to indicate which].

married to and living with each other ___ separated from each other ___
divorced from each other ___ married to and living with a different spouse ___
unmarried ___ unmarried due to death of or divorce from spouse ___
working ___ [full-time ___ part-time ___]

7. Do you live with: your mother and father ___ your mother ___ your mother and a step-father ___ your father ___ your father and a step-mother ___ a guardian [identify if a relative] ___ other [identify] _____

8. One the following scales, put an "M' for mother and "F" for father.

sense of humor. . . . . .no sense of humor

pretty/handsome . . . . . .ugly

strict with you . . . . . .lenient with you

fair . . . . . .unfair

easy to talk to . . . . . .hard to talk to

intelligent . . . . . .stupid

happily married to. . . . . .unhappily married
the other to the other

someone you would someone you would
like to be like . . . . . .not like to be like

someone you would someone you would
confide in . . . . . .not confide in

religious . . . . . .unconcerned about
religion

concerned about you . . . . . .indifferent toward
you

9. a. If you could change the behavior or attitude of your mother toward you, what would you change?

b. If you could change the behavior or attitude of your father toward you, what would you change?

10. Put the letter of each question on the scale to indicate the degree of your feeling or response to that question.

YES . . . . . .NO

a. Are you happy with the physical residence in which you live?
b. Are you happy with the neighborhood in which you live?
c. Are you happy to be a member of your family?
d. Do you think most of your friends have a happier? experience with their families than you have with yours?
e. Do you plan to marry?
f. Do you plan to have children?
g. If you answered yes to "f", do you plan to raise your children as you have been raised?

SPIRIT MASTER NO. 6 — GOALS

Multiple Choice:

If I had to describe myself, I'd say I am:

a) eager to get ahead b) pretty lazy c) somewhere in between

My position in life will probably be determined mostly by:

a) my own income and job success
b) the income and job success of the person I marry
c) the income level of my parents

In terms of career, I feel that:

a) I will be able to enter any field in which I am interested.
b) I will be limited in my career choices by society and the job market.
c) I will probably not be working for most of my life.

Of the following, I would most like to be thought of as:

a) successful b) a good person c) happy

The thought of dividing household chores equally between husband and wife strikes me as:

a) the way it should be.
b) a good idea, if both are working outside the home
c) a bad idea.

I think I would find my greatest satisfaction:

a) with my life centered around my family.
b) achieving success in my job.
c) meeting new people and getting involved outside the home.
d) combining a job and family.

Sentance Completion:

I do/do not (cross out one) think I could be happy spending most of my hours keeping house because . .

I do/do not (cross out one) think that children gain from having both parents work because . .

I do/do not (cross out one) think that a woman can be both a successful career woman and a good mother at the same time because . . .

When I see a successful career woman with a family, my reaction is . . .

When I see a successful career man with a family, my reaction is . . .

SPIRIT MASTER NO. 7 - EQUALITY AND THE LAW

Equal employmnet opportunity is protected by actions of the three branches of the Federal government.

Executive orders deal with discrimination in employment by the Federal government itself and by those who contract with the Federal government.

Court decisions have interpreted civil rights laws and the National Labor Relations Act to ban discrimination in private employment.

Congress, through Title VII of the Civil Rights Act of 1964, has established as law equal employment opportunities in private employment.

Below is a brief summary of recent Federal legislation and policies which have all but eliminated discrimination in employment "under the law". (U.S. Department of Labor, 1969.)

Equal Pay Act of 1963, requires employers to pay ALL employees equal wages for equal work on jobs requiring equal skill, effort, and responsibility performed under similar working conditions - regardless of the sex of the employee.

Title VII of the Civil Rights Act of 1964, forbids discrimination based on race, color, religion, sex and national origin by employers who have 25 or more employees, employment agencies who regularly supply employees for such employers, and labor unions which have 25 or more members.

Executive Order 11246 (September 29, 1965) forbids discrimination on the basis of race, color, religion or national origin by government contractors, federally assisted construction contractors, and banks in which federal funds are deposited (or which handle federal savings bonds).

Executive Order 11375 (October 13, 1967) amended E.O. 11246 to also prohibit discrimination on the basis of sex.

Executive Order 11478 (August 8, 1967) took additional steps to strengthen and assure equal employment opportunities. It restates the government intent to assure equal opportunity in federal employment to all people regardless of race, color, religion, national origin or sex, and to work for equal employment through continuing affirmative action programs in each executive department and agency. (These affirmative action programs would require providing enough resources to carry out an equal opportunities program, wide-spread recruiting to reach all sources of job candidates, full use of the skills of employees and maximum opportunity for employees to develop their abilities in advance).

"Order No. 4", issued by former Secretary of Labor George Schultz, amends E.O. 11246 and requires federal contractors to develop a written affirmative action program relating to the employment of minorities and women. It sets forth detailed guidelines to be

used in developing and judging these programs. Additional guidelines relative to sex discrimination were published in the Federal Register on June 9, 1970.

"Revised Order No. 4" was published in the Federal Register on December 4, 1971. The order outlines new requirements to correct the underutilization of minorities and women among nonconstruction contractors, and gives guidelines for determining when underutilization occurs. Efforts are required to correct any deficiencies in the employment of minorities and women at all levels and in all parts of the work force.

SPIRIT MASTER NO. 8 - CHANGE

Each of the factors listed below influences how fast our society changes. Put a "✓" next to those which work for change-and an "X" next to those which work against change.

_____ views people have had of minorities and women

_____ laws, constitutional amendments, and Executive Orders which affect our system of justice.

_____ concern for justice, equality and fair play

_____ habits of discrimination against certain people and looking down on them

_____ personal fears on the part of both men and women

_____ pressure groups formed to draw attention to special problems

_____ tendency of people and organizations to want to keep things the way they are

_____ hopes people have for moving upward and taking on more responsibility

_____ increased knowledge and skill in specialized fields

_____ belief in democracy and equality among large portions of the population

_____ ways of doing business and relationships in the business world that have not included minorities and women

_____ difficulty people have in imagining minorities and women as leaders and managers, and in trusting their abilities

_____ changes in the age, family size and lifestyle of the population

_____ power that is carefully guarded

_____ knowing how to use power, influence decisions and bargain

How much do you think you have changed in the last few years?

a) a lot b) fairly much c) not too much d) not at all

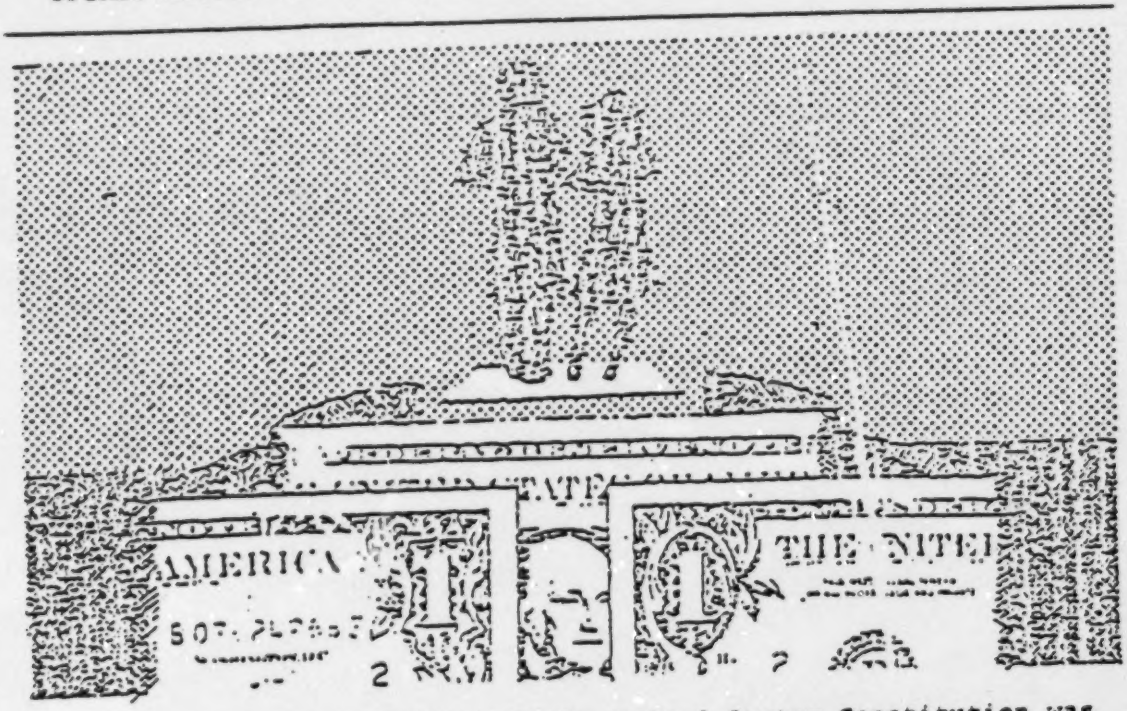
In which area have you changed most?

a) lifestyle b) values c) interests d) goals

To what extent are you trying to change more?

a) a lot b) fairly much c) not too much d) not at all

SPIRIT MASTER NO. 7A - EQUALITY AND THE LAW



The Equal Rights Amendment to the United States Constitution was passed by the United States Senate on March 22, 1972. The major paragraph states:

"Equality of rights under the law shall not be denied or abridged by the United States or any state on account of sex".

The proposal now goes to the individual states for consideration.

The amendment is intended to provide constitutional protection against laws and official practices which treat men and women differently. The mechanism to afford equality of rights for men and women already exists in the Fifth and Fourteenth Amendments. However, the Supreme Court has never ruled favorably to extend the "due process" provision of the Fifth Amendment or the equal protection concept of the Fourteenth Amendment to protection against sexual discrimination. If ratified by the states, the Equal Rights Amendment would assure the rights of all persons to equal treatment under the law without distinction according to sex.

What do you see as the advantages of an amendment such as this? ____

_____

_____

Do you see any possible disadvantages? If so, what are they? _____

_____

_____

HUMAN RELATIONS CHECK UP!

Directions: Begin by rating yourself on each of the human relations skills listed below. Then identify one skill that you would most like to work on.

HUMAN RELATIONS SKILLS	SELF – RATING		
	Above Average	Average	Below Average
1. Understanding Self			
2. Understanding Others			
3. Sensitivity to Others			
4. Interested in Others			
5. Respecting Others			
6. Sharing			
7. Honesty			
8. Accepting Responsibility			
9. Objectivity			
10. Dependability			
11. Positive Attitude			
12. Avoiding Arguments			
13. Admitting Errors			
14. Smiling			
SKILL TO WORK ON:			

SCRAMBLED!

Directions: Unscramble each of the human relations terms enclosed in the box below. Use these words to complete the sentences which follow.

fcevefeti	patda	atraitdut
tusrdtcrue	enquiu	tisnerte
ncooiotpaer	lasuac	lepepo
tefneibs	ytloaly	lhpsaresnoiti
yesructi	dernale	ndretantoielm

1. Human relations involves the ways that people form and conduct _____ with one another.

2. When people get along well together, they are practicing _____ human relations.

3. Since every person is _____, it is not always easy to understand and relate to the many different people with whom you come in contact.

4. A major part of your life is made up of other _____.

5. Some relationships are _____, such as those which develop at work.

6. Some relationships are much more _____, such as those with friends.

7. To be effective, you must _____ your human relations skills to the different situations in which you find yourself.

8. There are tremendous _____ to be derived from practicing effective human relations at your place of employment.

9. One advantage of getting along well at work is increased _____ from others.

10. Effective human relations at work can greatly increase your job _____.

(Continued)

SCRAMBLED (cont'd)

11. Employees are likely to exhibit much more _____ if they work in a pleasant, friendly environment.

12. One should always show a sincere _____ in others.

13. One should try to be cheerful and demonstrate a positive _____.

14. Human relations skills can be _____ and refined.

15. An important ingredient for successfully improving your human relations skills is personal _____.

HUMAN ECOLOGY

COPING SCALE
DIRECTIONS

For each question, check YES or NO if at all possible. If you feel that you do not know the answer, or it it is one half YES and one half NO, check both YES and NO.

There are no right or wrong answers, and a "high" score is not necessarily better than a "low" score and a "low" score is not necessarily better than a "high" score.

PART A	YES	NO
1. Do people who know you well think you get upset easily?		
2. Do people who know you well think you are stubborn?		
3. Do people who know you well think you understand other people's points of view and accept them the way they are?		
4. Do people who know you well think that when you get mad you get over it quickly?		
5. Do people who know you well think you overcome problems easily?		
6. Do people who know you well think you are reliable and responsible in meeting your financial obligations?		
7. Do people who know you well think you have continued to mature and grow emotionally as you have gotten older?		
8. Do you think the way you adjust to life can contribute to getting sick?		
9. Do you think that changing you life in some way might make it easier to get well once you get sick?		
10. If you were sick and were told to treat yourself with something that you did not understand and was difficult, but which no one would know about if you did not do it, would you do it?		

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COPING SCALE
DIRECTIONS (CON'T.)

PART B	YES	NO
1. Do you have good health?		
2. Do you think you had a satisfying religious education?		
3. Do you think your father was supportive and understanding?		
4. Do you think your mother was supportive and understanding?		
5. Do you think those close to you provide the emotional support?		
6. Do you think your housing is a problem?		
7. Are you satisfied with your occupation?		
8. Are you satisfied with your working condition?		
9. Is your income satisfactory?		
10. Have you set goals for the future that satisfy you and are realistic?		

To score the test, give yourself five points for every YES item in Part A EXCEPT items 1 and 2. For these give yourself five points for NO answers.

Give yourself five points for every YES answer in Part B EXCEPT item 6. For this item give yourself five points for a NO answer.

Wherever you answer the opposite of above, give yourself negative five points. Where you've answered YES and NO to an item you receive zero points. Thus it is possible to score between -100 and +100 combining the scores from Parts A and B.

STRESS FLOW CHART

1. Identify one situation in the school environment which is stressful.

2. How did you feel when you encountered this situation.

3. What was the outcome of the situation.

HUMAN ECOLOGY

SOCIOLOGY
PRE-TEST
Family/Social Institutions

Fill in the blanks (use sociological terms):

1. A family that includes the mother, father, children, grandparents, mother's brothers and sisters, and/or father's brothers and sisters, is called an _____ family.

2. A man married to four wives at the same time is practicing _____.

3. Newly married couples who traditionally take up residence with or near the parents of the bride are practicing the _____ rule of residence.

4. Your mother's sister's husband is a/an _____ relative to you.

5. Any group whose members are related to each other and which covers several generations all descended from a common ancestor is called a _____.

6. Tracing one's ancestry back through the father's ancestors is practicing the _____ rule of descent.

In the State of Delaware:

7. The youngest age a female can marry with her parent's consent is _____.

8. The youngest age a male can marry without his parent's consent is _____.

9. The length of time a Delaware resident must wait after applying for a marriage license before receiving it is _____.

10. A serological test is required for a marriage license. Yes No

11. List 3 important functions of the family.

12. List 3 important factors that contribute to unsuccessful marriages.

13. List 3 important grounds for annulment in Delaware.

14. List 3 legal grounds for divorce in Delaware.

15. Identify an acceptable public social agency or institution in New Castle County that people could turn to with the following problems:

    a. wanted to check to see if they had veneral disease.
    b. wanted in formation on drugs and drug abuse.
    c. wanted to determine if they were pregnant.
    d. were a destitute woman desperately in need of food and shelter.
    e. needed the services of an attorney but couldn't afford them.

FAMILY FUNCTION EVALUATION ASSIGNMENT

1. Use the following list of family functions. On a scale of "1" to "10", with "1" indicating a high degree of performance and "10" a low degree of performance, rate your own family on how well you perceive their performance of each of the functions.

2. On any function where you have rated your family below a five, explain why you gave them such a relatively low rating.

Name:

TO WHAT INSTITUTION OR AGENCY MIGHT YOU TURN IF:

1. you were a woman, frequently the object of physical assaults by your husband?
2. you thought you had a veneral disease?
3. you want information on drug abuse?
4. you felt you should receive cooperation as the victim of a violent crime?
5. you were interested in hiring a handicapped person?
6. as a woman you felt you were being discriminated against in your place of employment?
7. you were upset over the business practices of a particular store in Wilmington?
8. you were an unmarried mother who needed support for your child from the child's father?
9. you were a woman who needed temporary shelter for any of a variety of reasons?
10. you needed a lawyer to defend you in court but couldn't afford one?
11. you were a senior citizen who needed someplace to go during the day to be looked after and fed?
12. you were confined to your home or bed and needed daily nursing attention?
13. you felt your constitutional guarantees had somehow been violated?
14. you were willing to serve as a parent, friend, advisor on a weekly basis to a young person who lacked a father?
15. you wanted information on a proper diet for your newborn infant?
16. you felt some kind of action should be taken to correct a situation in the black community?
17. you needed information on how to acquire the necessary training for a particular job?
18. you were poor and needed a meal and lodging?
19. you wanted to determine if you were pregnant?
20. you, as a teenage mother, needed a place to care for your infant so you could continue your education or work?
21. you were addicted to gambling?
22. you needed counseling on some marital problem?
23. you wanted information on how the mentally ill are treated in Delaware?
24. you were a senior citizen and needed transportation to visit your doctor?

Summary and Evaluation Form for Speakers from Social Agencies and Institutions

SPEAKER: _____ DATE: _____

AGENCY OR INSTITUTION _____

1. What kinds of services does the agency/institution offer?

2. To whom are these services offered?

3. What fee, if any, is charged for these services?

- - - -

Summary and Evaluation Form for Speakers from Social Agencies and Institutions

SPEAKER: _____ DATE: _____

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1. What kinds of services does the agency/institution offer?

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- - - -

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AGENCY OR INSTITUTION _____

1. What kinds of services does the agency/institution offer?

2. To whom are these services offered?

3. What fee, if any, is charged for these services?

- - - -

_____ ?

In 1516 Sir Thomas More wrote a book called Utopia. It described an imaginary place with perfect living conditions. All of us would like to live in such a place. But we can't! We live here. The area described below obviously is not Utopian. Your task is to help it reach perfection.

Physical Setting

_____ is in the flood plain of a major river. Patchy woods and farms cover the hills to the west of the city. Flat lands and marshes are to the east and south. The _____ river flows into the ocean about 70 miles away. There is a large estuary there. North and south of this estuary are recreational beaches. The coastal current flows south. Access to these shore areas has increased dramatically in the past decade.

Definite seasonal changes occur in the climate of _____. Summers are fairly warm and dry. Winters are cold. Total precipitation for the year is about _____ inches (cm.). There is snow in the winter and rain at other times. Thunderstorms bring summer rainfall. Storms move mostly from west to east. There is sunshine about 80% of the days in the summer. However, about _____ of winter days are sunny.

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_____ lies on the sloping edge of a land plateau. To the west of _____ elevation increases gradually, with heavier snow occuring at the higher elevations. To the east and south one finds a flat tidal-plain running about 80 miles to the coast.

The _____ river generally flows from northwest to southeast. It has several tributaries. The river and several deep wells provide water for _____. The river receives city and industrial wastes. The water is also used to cool machinery in several industries. Marinas are found down-river of the central urban area.

The City

_____ has residential, industrial, commercial, and nearby farming areas. There is one long swampy area along the river; and there are several parks. The population of the city is 80,000. However, about _____ more people live within a 20 mile radius. People in _____ receive city water from a tributary and use a city-county sewer system. People in the rural areas have septic tanks and depend upon wells for their water.

_____ is within a 30 minute drive of a large city in another state. Its one and a half million people, being upriver from _____, have a major effect on the water quality of the _____ river and the people of _____.

Economic Base

There are many light industries in _____ and the surrounding country. The entire area is considered a major chemical production source for the nation. There are also automobile assembly plants, a steel mill, and a paper mill. Large amounts os raw materials and fuel are needed by these industries. Materials come into the county area by river barges, trucks, trains, and airplanes.

Many industries use high-sulfur coal and fuel oil. Much of the electricity for the area is generated by these fuels. Homes are heated mainly by natural gas and fuel oil. A few homes use electricity, and some recently have turned to burning wood or coal.

Much of the petroleum for the area comes from large tankers which bring in crude oil from other sources. They dock above and below the city where there are several oil refineries. Along the coastal sections there is exploratory deep-well drilling for natural gas and oil on the continental slope.

Much industrial waste is released into the air. The industries produce large amounts of solid waste. Several companies have been accused of violating the pollution laws. Industries have been slow in solving their problems. The reason given is "lack of funds." Some small industries have closed. Others face similar problems and may close soon. Unemployment levels are close to the national average and the number of people on welfare is substantial.

Over half the people work in industry. Others work in business, education, and government. Several industries want to leave the area, feeling other places offer better living conditions for their workers. The government is in favor of bringing new industry to the area. This would bring in more taxes and make the community more livable.

Farmers of the country are becoming extinct. A few dairies exist nearby, but milk production has dropped off in recent years. Farmers blame this on population. Taxes and and rising land values force some farms to be sold each year, with the ground becoming subdivided.

TYPE POLLUTION	SOURCES	MAJOR POLLUTANTS	BIOLOGICAL EFFECTS	MATERIAL EFFECTS	POSSIBLE SOLUTIONS

HUMAN ECOLOGY
ENVIRONMENTAL FACTORS

HUMAN ECOLOGY

ENVIRONMENTAL FACTORS

PROBLEM SHEET NAME:

1. Read four page essay in class.
2. Fill in blanks at home - research answers.
3. After reading Article, list 5 major problems you have discovered about this area (rank order them)

   a.

   b.

   c.

   d.

   e.

Using the above list as a guide, circle the task force you will belong to, and which will be responsible for the solution of a specific problem.

1 2 3 4 5

HUMAN ECOLOGY

ACTIVITY
ENVIRONMENTAL FACTORS

Read, "Energy Sources of the Future" and complete the following chart on the five sources below:

SOURCE	ADVANTAGES	DISADVANTAGES	POTENTIAL SUPPLY	COST
Geothermal				
Wind				
Waste				
Solar				

Use this information contained in the chart for class discussion.

HUMAN ECOLOGY

ENVIRONMENTAL FACTORS

ACTIVITY SHEET 1

Land Use

Name_____
Date_____

1. The above figures represent different groups in a community. Are the interests of these groups same? _____

different? _____

2. Any decision that involves community planning must take into account the varying interests of all groups. Can you think of some of the reasons why groups of people have different interests?

_____

_____

One thing that everybody can agree on is the improvement of the "Quality of Life." Even this is not so simple because different people have different ideas of what they mean by "Quality of Life."

In order to better understand how values are related to "Quality of Life," you are going to play the roles of community interest groups who are meeting to decide on how to zone their town.

HUMAN ECOLOGY

ENVIRONMENTAL FACTORS

ACTIVITY SHEET 2

Land Use

Name_____

3. Criteria (values) of interest groups

Residential	Commercial
_____	_____
_____	_____
_____	_____

Industrial	Public
_____	_____
_____	_____
_____	_____

4. The model and constraints of today's problem will be discussed with your teacher.

Optimization

a. Land-Use Analysis:

Residential _____ %

Commercial _____ %

Industrial _____ %

Public _____ %

b. Compare your group's result with the result of other planning groups in your class and/or with the result of an actual planning board.

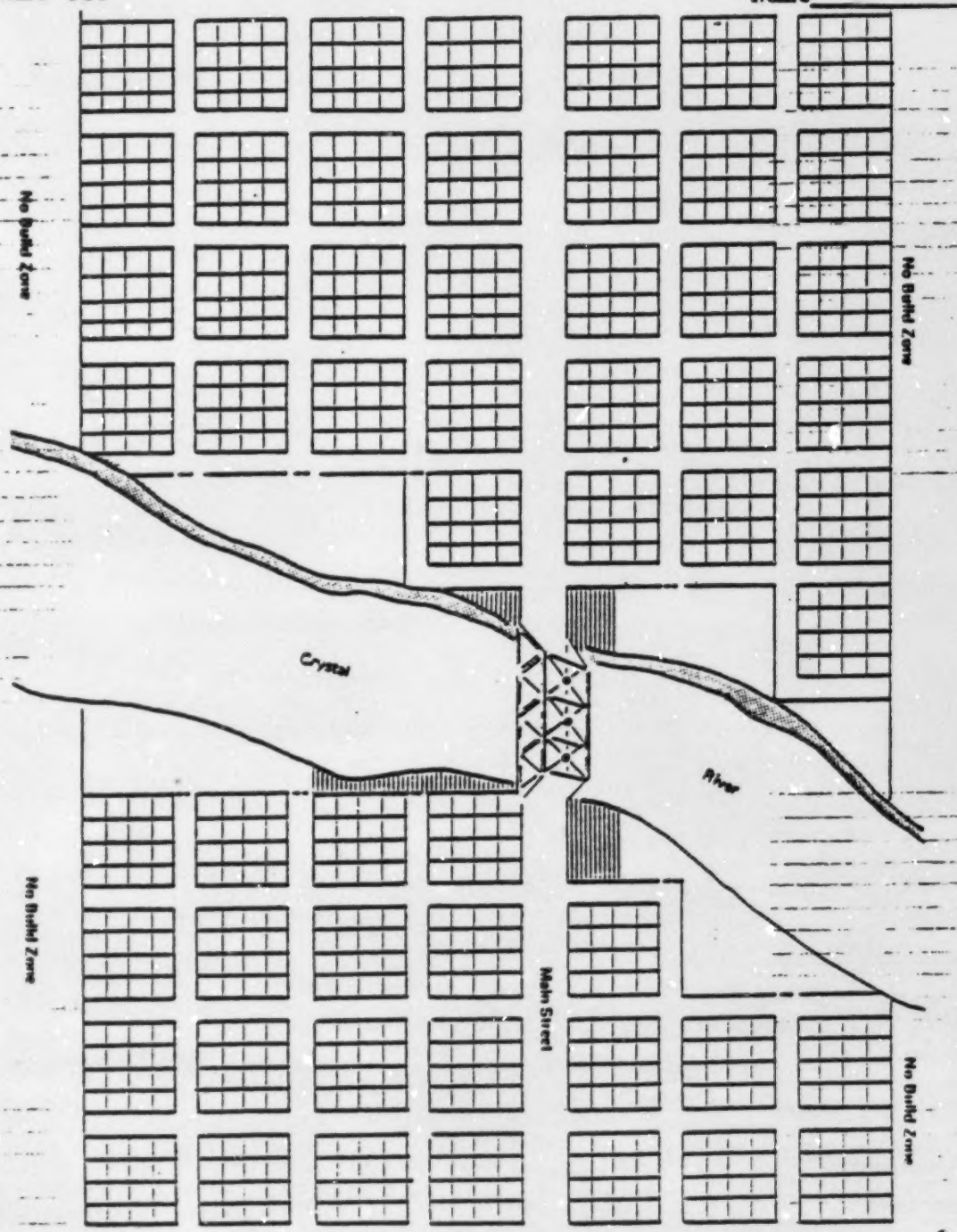
HUMAN ECOLOGY

ENVIRONMENTAL FACTORS

ACTIVITY SHEET 3

Land Use

Name_____



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1 Fill in the Punnett square and indicate the sex of each individual.

	male:	X	Y	Sex of individual
female:	X	1	2	2
	X	3	4	4

2 What is the sex of each of these genotypes?

a. XX

b. XY

c. XO

d. XXY

e. XYY

f. XXX

g. XXXY

h. XXYY

EXERCISE 2a

Using the following symbols for color vision, complete the Punnett squares. (Within a box, place a normal gene before a color-blind allele.)

X^C = normal gene

X^c = color-blind allele

X^CX^C = normal female

X^CX^c = normal female (a carrier)

X^cX^c = color-blind female

X^CY = normal male

X^cY = color-blind male

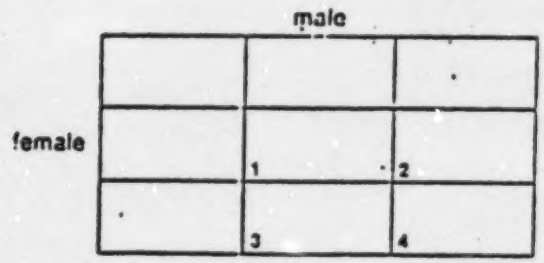
1 A normal male is crossed with a carrier female.

	male:			
				Probability of color-blind girls:
female:		1	2	Probability of girls as carriers:
		3	4	Probability of color-blind boys:

2 A color-blind female and a normal male are crossed.

	male:			
				Probability of color-blind girls:
female:		1	2	Probability of girls as carriers:
		3	4	Probability of color-blind boys:

3 A color-blind male and normal (noncarrier) female are crossed.



Probability of color-blind girls:

Probability of girls as carriers:

Probability of color-blind boys:

EXERCISE 2b

Using the following symbols for hemophilia, complete the Punnett squares.

X^H = normal gene

X^h = hemophilic allele

X^HX^H = normal female

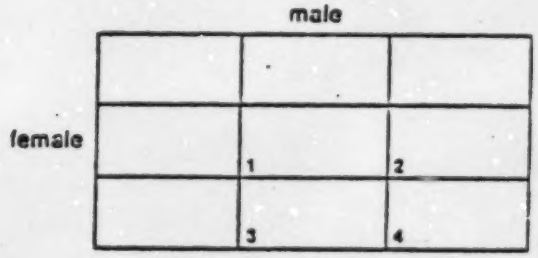
X^HX^h = normal female (a carrier)

X^hX^h = hemophilic female

X^HY = normal male

X^hY = hemophilic male

1 A normal male and a carrier female are crossed.

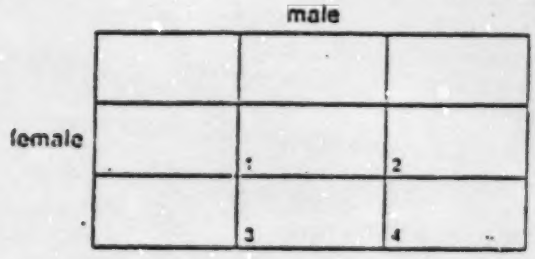


Probability of hemophilic girls:

Probability of girls as carriers:

Probability of hemophilic boys:

2 A hemophilic male is crossed with a hemophilic female. (This is really a theoretical problem, since there are virtually no hemophilic females. A marriage that would produce a hemophilic female is rare, and the occurrence of a hemophilic female is even rarer.)



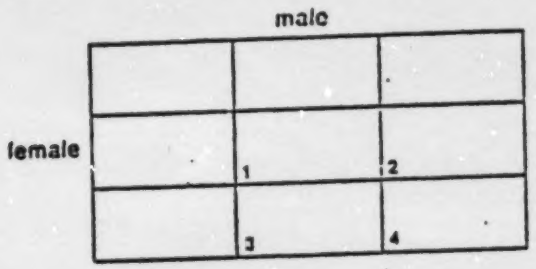
Probability of hemophilic girls:

Probability of girls as carriers:

Probability of hemophilic boys:

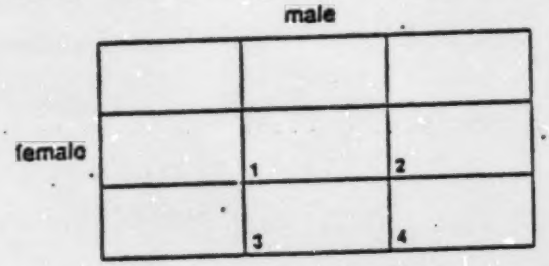
Complete the following crosses, where *Pp* = pigmented and *pp* = albino

Cross 1 *PP* pigmented man with *pp* albino woman



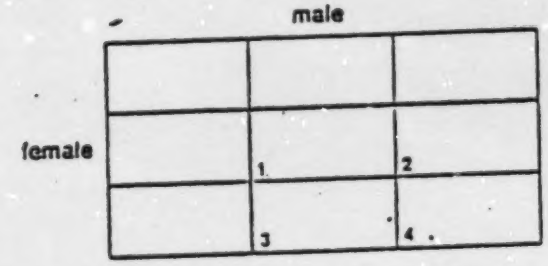
Proportion of albino children to pigmented children:

Cross 2 *Pp* pigmented man with *Pp* pigmented woman



Proportion of albino children to pigmented children:

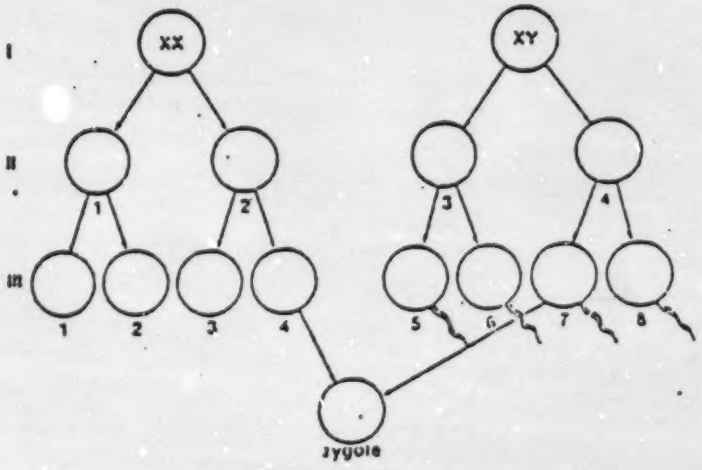
Cross 3 *Pp* pigmented man with *PP* pigmented woman



Proportion of albino children to pigmented children:

EXERCISE 5

Show how an individual could obtain an XYY chromosome complement.



The future of mankind lies waiting for those who will come to understand their lives and take up their responsibilities to all living things.

Vine Victor Deloria Jr.